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REFUSE DISPOSAL IN MILWAUKEE

Methods and Plants Used During Past Thirty Years—Report of Rudolph Hering—Plans Contemplated for Utilizing Surplus Steam Power—Detail Description of Plant—Handling of Refuse—Ventilation

By FRED S. SLY

THE city of Milwaukee has probably had a wider and more varied experience in the disposal of refuse than any other city on the American continent. Practically every known method of disposal has been tried at some time in the city's history and the subject has been a popular theme for nearly every political campaign during the past forty years.

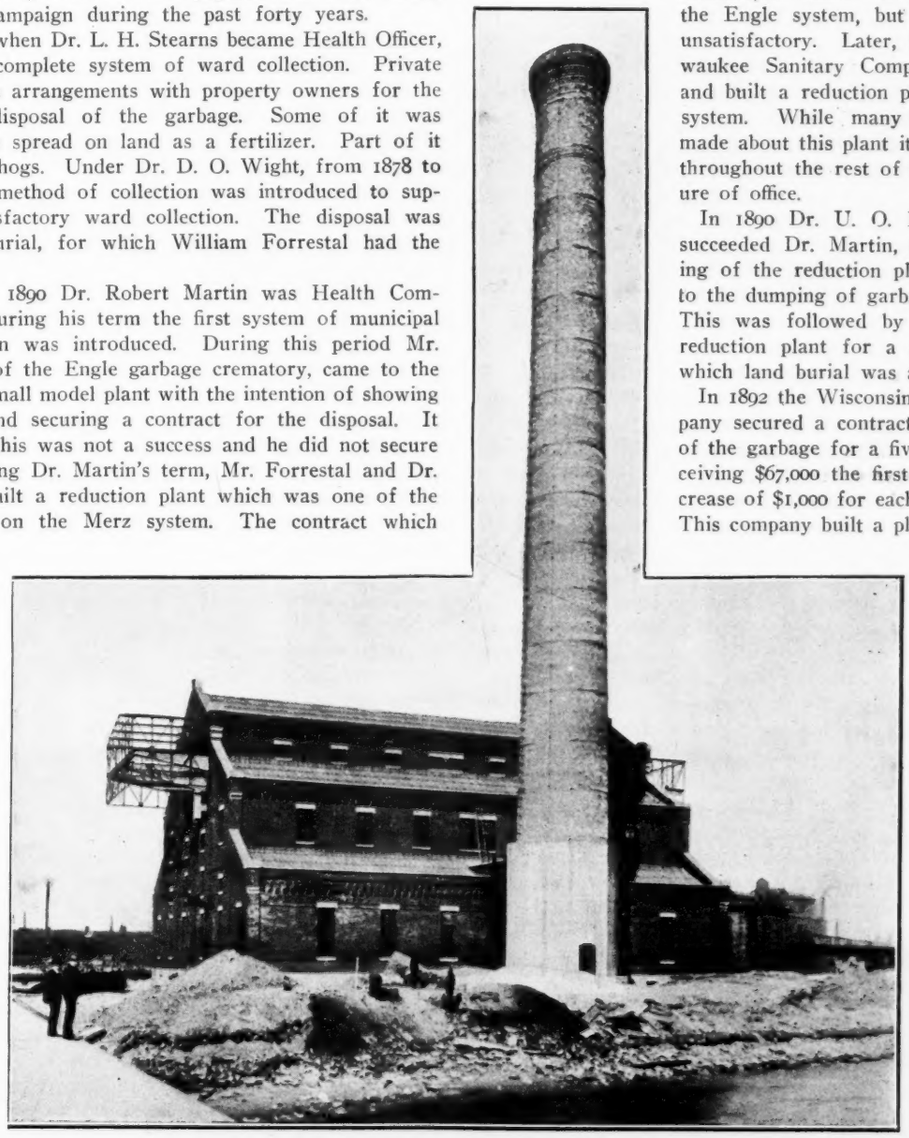
Prior to 1877, when Dr. L. H. Stearns became Health Officer, there was an incomplete system of ward collection. Private contractors made arrangements with property owners for the collection and disposal of the garbage. Some of it was buried and some spread on land as a fertilizer. Part of it was also fed to hogs. Under Dr. D. O. Wight, from 1878 to 1881 a uniform method of collection was introduced to supplant the unsatisfactory ward collection. The disposal was principally by burial, for which William Forrestal had the contract.

From 1881 to 1890 Dr. Robert Martin was Health Commissioner, and during his term the first system of municipal garbage collection was introduced. During this period Mr. Engle, inventor of the Engle garbage crematory, came to the city and built a small model plant with the intention of showing its advantages and securing a contract for the disposal. It is reported that this was not a success and he did not secure a contract. During Dr. Martin's term, Mr. Forrestal and Dr. A. F. Marden built a reduction plant which was one of the first to operate on the Merz system. The contract which they secured was soon canceled because of the nuisance created and a return was made to the older method of disposal on land or dumping into Lake Michigan.

Later Dr. S. S. Kilvington came to the city and built an incinerator which was a modification of the Engle system, but this also proved unsatisfactory. Later, in 1888, the Milwaukee Sanitary Company was formed and built a reduction plant on the Merz system. While many complaints were made about this plant it continued in use throughout the rest of Dr. Martin's tenure of office.

In 1890 Dr. U. O. B. Wingate, who succeeded Dr. Martin, ordered the closing of the reduction plant and a return to the dumping of garbage into the lake. This was followed by a return to the reduction plant for a short time, after which land burial was again resorted to.

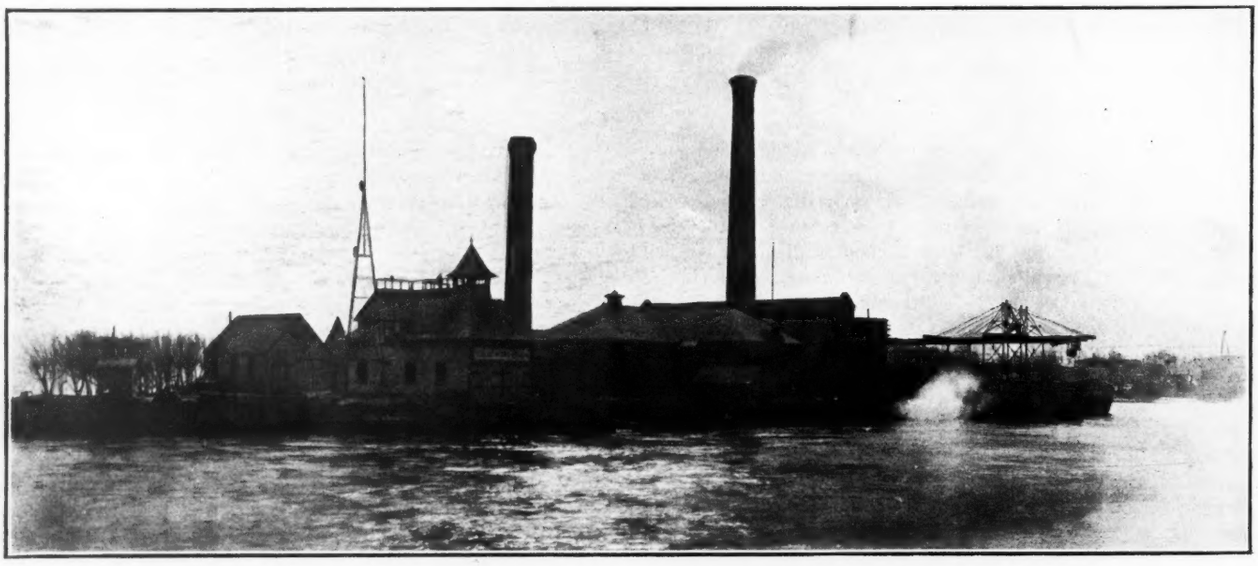
In 1892 the Wisconsin Rendering Company secured a contract for the disposal of the garbage for a five years' term, receiving $67,000 the first year and an increase of $1,000 for each succeeding year. This company built a plant some thirteen



MILWAUKEE REFUSE DESTRUCTOR, SHOWING CRANE RUNWAY AT REAR

miles north of the city at Mequon, and transported the garbage there by rail and boat. At the expiration of the contract an unsuccessful attempt was made to renew it, and Dr. Walter Kempster, who had succeeded Dr. Wingate, again resorted to land burial. Surrounding towns objected to this method of disposal and after considerable agitation attempts were made to build a municipal disposal plant. Various rulings of the court prevented the consummation of this plan until 1900, when a contract for a municipal plant was awarded to the Engle Sanitary & Cremation Company to build a furnace on Jones Island for $91,500. This plant has continued in use to the present time and the garbage of the city has been disposed of there except for a few months each winter when the plant has been shut down for overhauling. At such times the garbage is buried outside of the city.

In April, 1906, Dr. G. A. Bading was appointed Health Officer. He had made a careful study of the question of the disposal of refuse and felt that changes should be in the matter of refuse disposal in Milwaukee. His views were brought to the attention of the citizens and members of the Council, and it is largely through his efforts that the modern plant now just being put in operation has been realized.



JONES ISLAND GARBAGE DISPOSAL PLANT

There were several reasons why it was deemed necessary to have a new disposal plant. First, the Jones Island plant did not have sufficient capacity to properly and economically handle the garbage during the summer months, when the sanitary disposal of such matter is most necessary. Second, the plant is located on an island and the transportation across the river and incident handling made up about 40 per cent of the entire cost of disposal. A third and, from the modern sanitary standpoint, very important reason was that the plant handled only garbage and dead animals, the other refuse such as ashes, rubbish, etc., being disposed of by dumping.

After considerable study by Dr. Bading and other city officials, one of the wisest plans that any city can follow, when special municipal problems come up, was decided upon. This was the calling in of a man of expert engineering and economic training and with an unbiased mind to act as an advisor to the city. In August, 1907, the Council passed a resolution to retain in this capacity Dr. Rudolph Hering and immediately thereafter he began an investigation of the conditions in the city. On December 23 he presented to the Council a most complete and comprehensive report, an abstract of which was published in MUNICIPAL JOURNAL AND ENGINEER at that time.

The investigation covered the city by wards and the character of the population, buildings and industries in each ward were given due consideration. Careful data had previously been kept relative to the garbage of the city and this was checked over.

Observations were made of the garbage and refuse in all sections of the city and at various seasons of the year to determine the exact conditions existing at all periods of the year as well as average conditions. A study was made of the methods of collection and the routes traveled by the teams. After the collection of all these data a careful study was made of the various possible methods of disposal and the final recommendation decided upon.

Summer collection from the hotel and restaurant district is made twice a week. In the residence district the collection varies from once in five days to once in seven days, the latter being among the residences of the poorer classes, where it has been found the garbage is much less in quantity. The intervals in winter collection are somewhat longer, the maximum being ten days. No collections are made on Sundays or legal holidays.

An interesting feature of the report deals with the condition of the garbage that was buried. Burial is accomplished by turning a furrow 10 or 12 inches deep, in which the garbage is placed and then covered. After six months very little decomposition had taken place. After a year and a half much of the garbage had disappeared. Paper and all easily decomposed matter had rotted, while feathers, orange peel and cloth had hardly undergone any change. After four years the garbage had entirely disappeared.

For the year 1906 the total cost of collecting and disposing of the garbage was $116,935.70. A total of 35,245 tons of garbage were burned and the cost of the coal alone was 38 cents per ton. In the same year $153,806.88 was spent for the collection of ashes and rubbish. For the most part this was deposited on dumps. Not all the ashes and rubbish in the city was included in this cost, as some of it was privately handled. No stable manure was included as this is disposed of privately. Mr. Hering recommended that the disposal of this be controlled by the city at the expense of the individual; also that street sweepings be disposed of by some other method than depositing on dumps.

In order to ascertain the composition of the garbage and its value either as a container of grease or as a source of fuel, Prof. R. E. W. Sommer, of Milwaukee, analyzed an average sample. The results are given below:

In 100 pounds of dry garbage there were contained:

Ashes	61.88 lbs.	Nitrogen	1.61 lbs.
Combustible Matter	38.12 "	Glucose	12.50 "
Grease	8.775 "	Phosphoric Acid	2.31 "

One pound of dry garbage on combustion gave 4,522 British Thermal Units of heat.

In 100 lbs. of wet garbage which contained 78 lbs. of water there were contained:

Ashes	13.61 lbs.	Nitrogen	.35 lbs.
Combustible Matter	8.39 "	Glucose	2.75 "
Grease	1.93 "	Phosphoric Acid	.51 "

It was found that if piled to a height of 8 inches, 2/3 per cent of the water drained off, at a height of 16 inches, 7.5 per cent drained off; and at a height of 24 inches, 9⅓ per cent drained off. On this last assumption the calorific value of the garbage was determined and it was found that with every 100 pounds of wet garbage it was necessary to evaporate 68⅔ pounds of water, which would require 66,371 B.t.u. With the heat necessary to raise the garbage to the boiling point this was increased to 82,173 B.t.u. From the 22 lbs. of dry garbage, with a calorific value of 4,522 B.t.u. per pound, 99,484 B.t.u. could be realized, so theoretically the garbage contains enough combustible to burn itself without additional fuel. In practice there will be some losses, but the conclusion was reached that there should be no difficulty in burning the garbage alone, without fuel, during a considerable part of the year.

After reviewing completely the data at hand Mr. Hering discussed in detail the disposal of refuse by the two methods, reduction of the garbage. and incineration of all the refuse. For disposal by reduction it was assumed it would be necessary to build a plant at Mequon, outside the city, which would require the transportation of the garbage there without any saving in the city collection, and at the same time leave the other refuse for disposal by some other means. In estimating the cost of an incineration plant for handling all the refuse, which was that recommended and adopted, he assumed the site finally selected, which is at the harbor edge and about midway of the city north and south. With this location the haul is all down grade, making the cheapest possible transportation. The estimated cost of the plant was $200,000. The estimated cost of the disposal of 300 tons daily, allowing for operation, interest and depreciation and assuming certain revenues from the sale of power, was 26 cents per ton. If nothing in the way of revenue is realized, the estimated cost of disposal will be 76.8 cents per ton.

After Mr. Hering's report was made public there followed a considerable amount of discussion in the council and among the public generally. This finally led to the retaining on February 21st, 1908, of Mr. Hering, as the city's expert with instructions to prepare plans and specifications for the construction of a suitable garbage disposal plant in accordance with his recommendations. On May 4th, 1908, he presented the necessary information to the council. This included the general outline of the proposed plan and gave certain definite results which the contractor would be required to meet. This left the details of the design open and allowed free competition. The architectural design of the building was not specified, but was left to the city authorities and was finally worked out in the office of the building inspector.

After further consideration a resolution was introduced in the council August 17th, 1908, and later passed, authorizing the Board of Public Works to construct the plant and necessary buildings. The Board advertised for bids which were received and compared and the contract was finally awarded to the Power Specialty Company on April 3d, 1909, the plant to be completed in one year. Work was started on April 26th, 1909, and the plant as described later is now almost ready for operation; although the time limit has been extended to May 15.

The design of the building called for the installation of only such machinery as would be necessary in the operation and lighting of the plant. A study of the disposal plans shows that a much larger amount of power will be available than that actually needed about the plant. To determine the best use to be made of this surplus power the city council, on December 6, 1909, authorized the Power Improvement Company of Milwaukee, to make investigations and recommend a plan which would bring the most return to the city. This report was submitted on January 3, 1910.

The resident engineer, Mr. Samuel A. Greely, gave as an official estimate that there would be an average of 21,000 pounds of steam at 70 pounds pressure available per hour in excess of the requirements of the plant and that the minimum amount under the poorest conditions would not be less than 18,000 pounds per hour. Using this latter figure as a basis of estimating, three propositions were possible; first, selling the excess steam in such quantities and at such times as it is generated; second, using the steam to operate ice-making machinery; third, using the steam to operate electric generating machinery.

The first proposition was not considered. On the second proposition, the Vilter Mfg. Co., of Milwaukee, submitted estimates which showed that the steam available would operate a 400-ton ice plant. The cost of such a plant would be about $370 000 and the city would have to market the ice. If everything went well the scheme might show a profit.

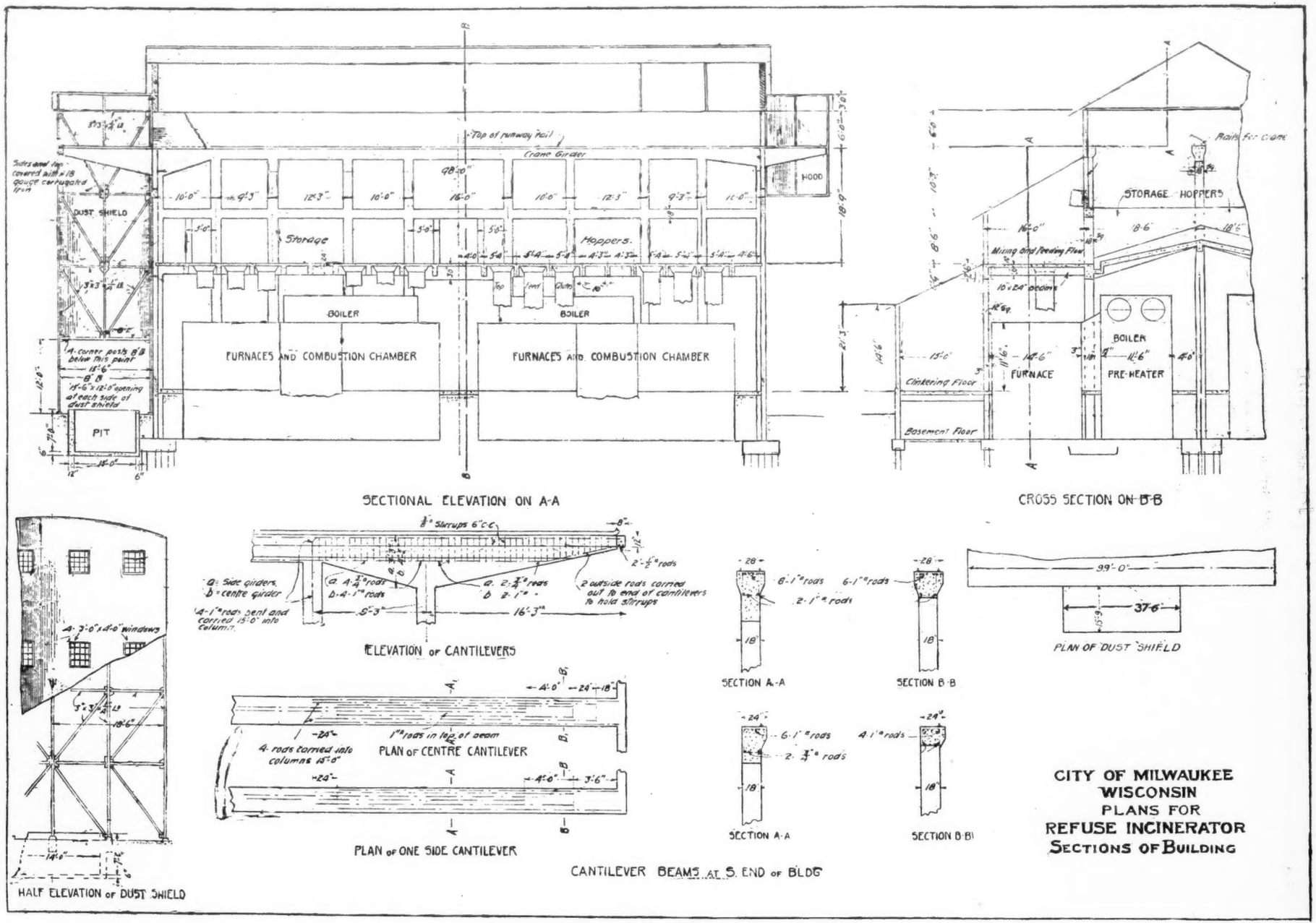
The third plan contemplated was the one finally recommended. By raising the steam pressure to 150 pounds and superheating it 100° there would be enough steam available to run 1,000 K.W. steam turbo-generator. The cost of the equipment necessary for the electrical apparatus, as submitted by Allis-Chalmers Company, was $40,000. The uses that could be made of the current thus generated were: To operate a motor-driven pump at the North Point Pumping Station; to operate the pump at McKinley Park Station; to operate the pump at Kinnickinnic Station; to operate the pump at Jones Island Sewage Station; to furnish current for the City Hall; to furnish current for the Public Library and Museum; and to furnish electric current for the operation of 1,000 street arc lamps.

The garbage plant will not be operated Sundays and holidays, so that any plan contemplating continuous service would require auxiliary apparatus. The estimated cost of the street lighting system with necessary auxiliary plant was $413,580 and after allowing 12 per cent for interest, depreciation, etc., the yearly saving was $34,071. The cost of equipment for driving pumps at North Point, McKinley Park, Kinnickinnic and Jones Island was $124,580 with a yearly saving of $24,750. Or, if there was added to this certain downtown lighting, the City Hall and the Library, the cost would be $281,580 with an annual saving over present cost of $49,920. The two last are recommended as they show earnings of approximately 20 per cent.

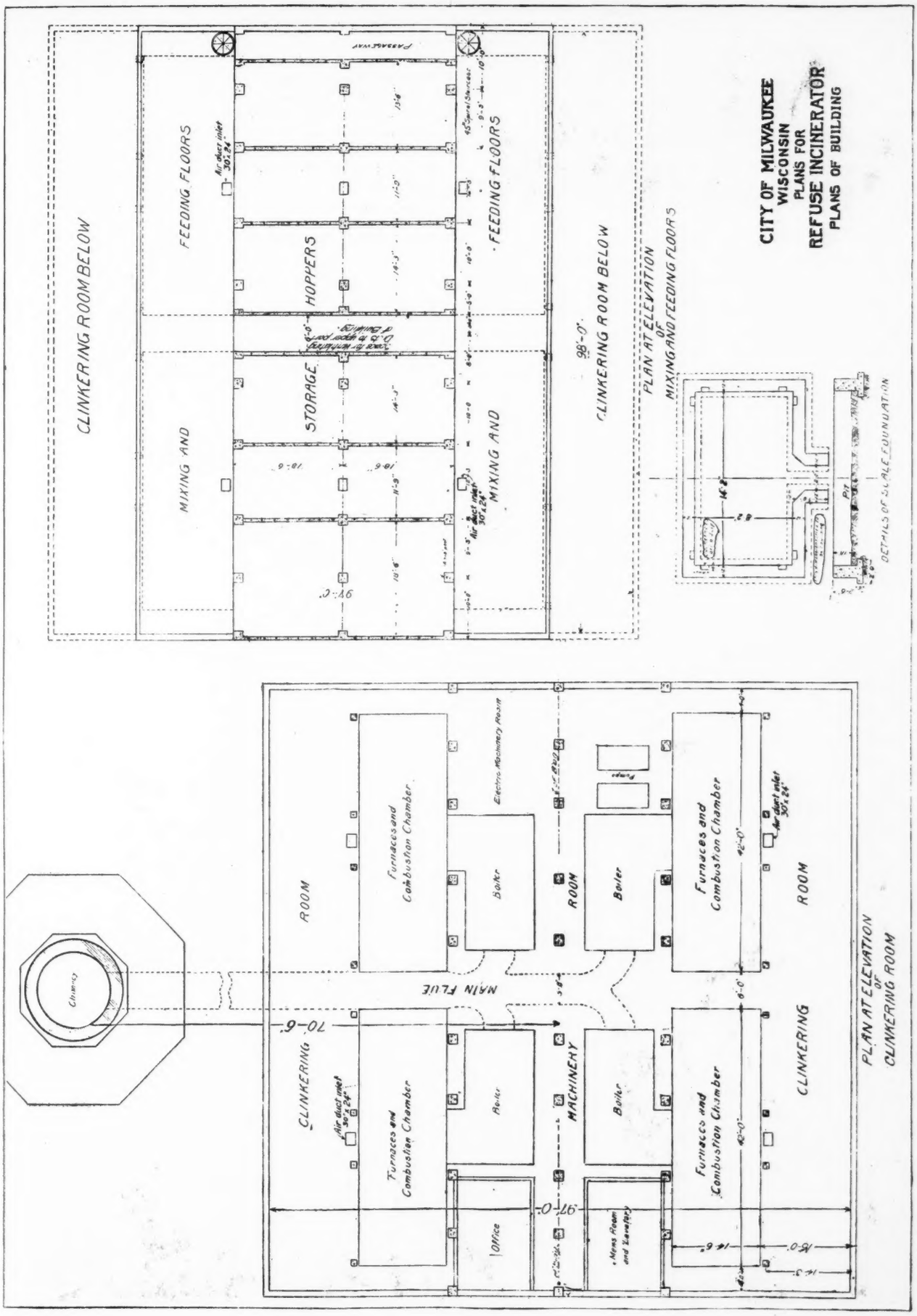
No action has yet been taken on this report and probably none will be until after the refuse plant is in full operation, but the figures show the possibilities to be derived from the use of the surplus power.

The new garbage disposal plant is located at the foot of Erie Street directly at the mouth of the harbor. The old Jones Island plant, which has been in service a number of years, is directly across the river. The immediate surroundings of the plant are such that they would not be seriously affected if there should ever be a nuisance from it. There are a few low-class houses, the nearest more than 300 feet away, and a warehouse which runs along the river bank. Across the river in one direction is the present disposal plant and the life saving station, while in the opposite direction are some manufacturing establishments.

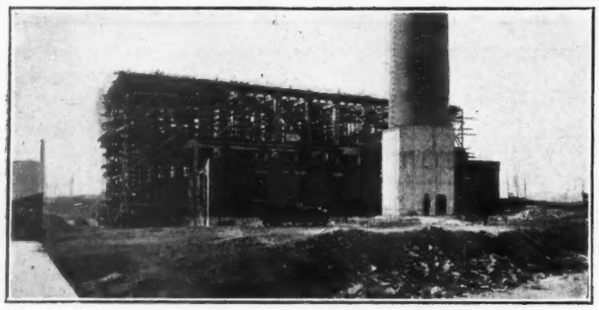
Architecturally and structurally the building is very pleasing and is in keeping with the dignity of a city institution, while showing that its use is purely utilitarian. It occupies a ground space approximately 100 feet square. The foundation is made of monolithic concrete carried on piles and every precaution has been taken to prevent any possibility of settling. The frame work is composed of reinforced concrete columns, girders and beams. The columns form panels in the exterior surface which break any monotony which such a large extent of wall might suggest. The exterior walls are a dark red pressed brick backed by ordinary hard burned buff brick, except on the first and second floors, which are waiscotted to a height of six feet with a brown glazed tile. All floors are made of concrete with steel rods as reinforcement. The roof is made in what may be



SECTIONS OF REFUSE INCINERATOR BUILDING



GENERAL PLAN OF INCINERATOR BUILDING AND PLANT



DESTRUCTOR HOUSE. CONCRETE FORMS IN PLACE

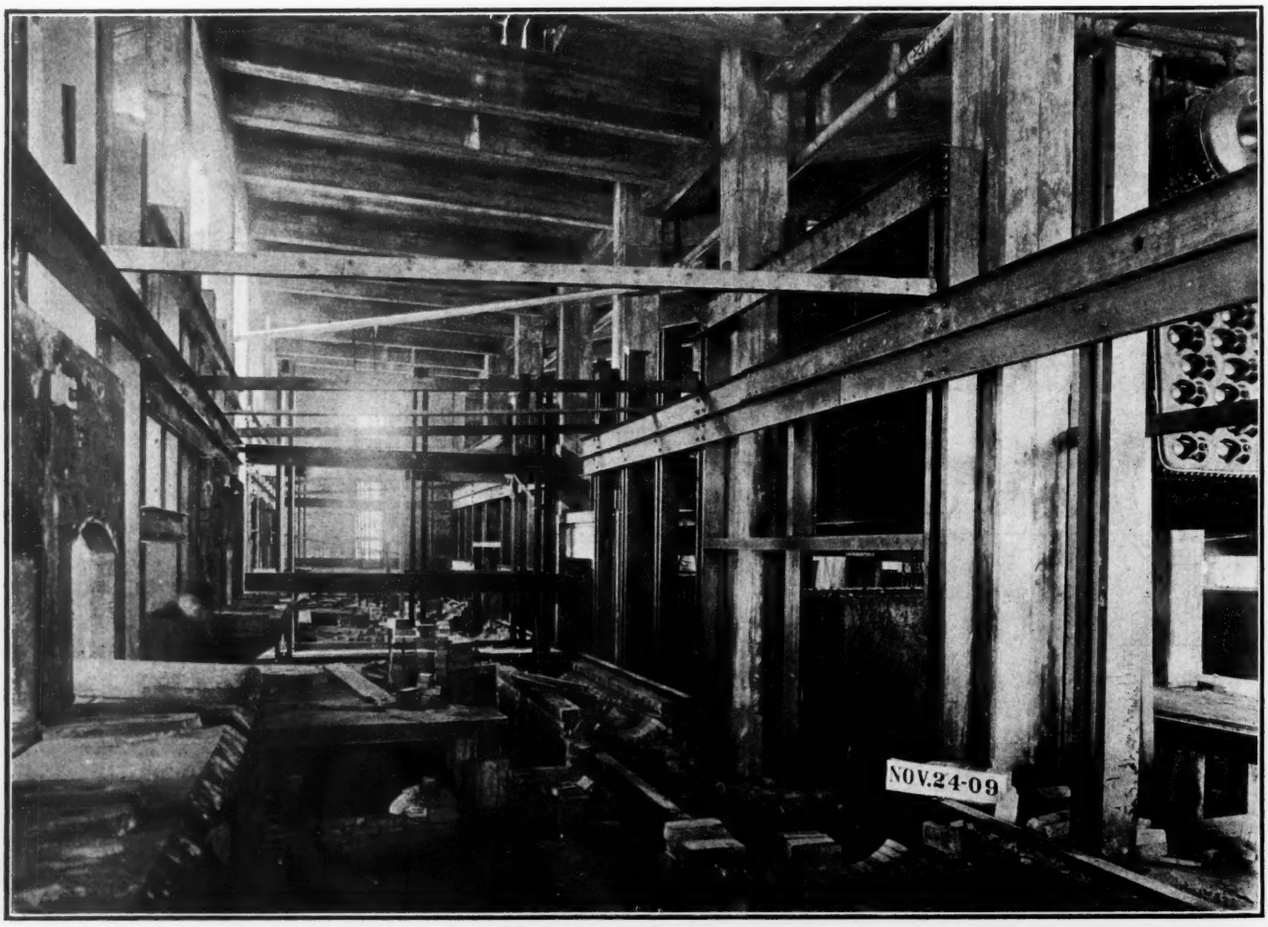
termed a series of monitors as the full width is kept only on the first floor and the building is narrowed as it rises because not so much room is required. The minimum height of the first story is 13 feet 6 inches at the side wall. Over the furnaces the height is 18 feet 6 inches. The second story, which reaches from the front of one row of furnaces to the front of the row on the other side, has a height of 10 feet 2 inches, while the maximum height is 18 feet 9 inches. Above this rises the last section in which is located the crane runway, and this has a minimum clearance of six feet. Federal concrete roofing slabs are used as a covering. The extreme outer walls of the building are carried two feet above the roof line of that section and serve to prevent snow sliding off the roof onto the roadway alongside. A gutter is formed inside this battlement and drain pipes are carried down inside the building to carry off the water. At the northern side of the building a stack built of buff tile has been erected. This is supported by a very substantial foundation extending some 16 feet above the surface of the ground. The stack rises 154 feet above the foundation and is finished with a somewhat ornamental top. The interior diameter at the bottom is 11 feet 5 inches and at the top 10 feet. Four lightning rods offer protection against electrical storms.

Possibly the best method of describing the apparatus will be to trace the course of the refuse through the plant, and that plan will be followed out. In general the plan consists in the delivery of the refuse, the burning of it in the four units of the disposal plant, the making of steam from the heat thus evolved, and finally the use of this steam in engines which will drive electric generators that will furnish power about the plant and elsewhere.

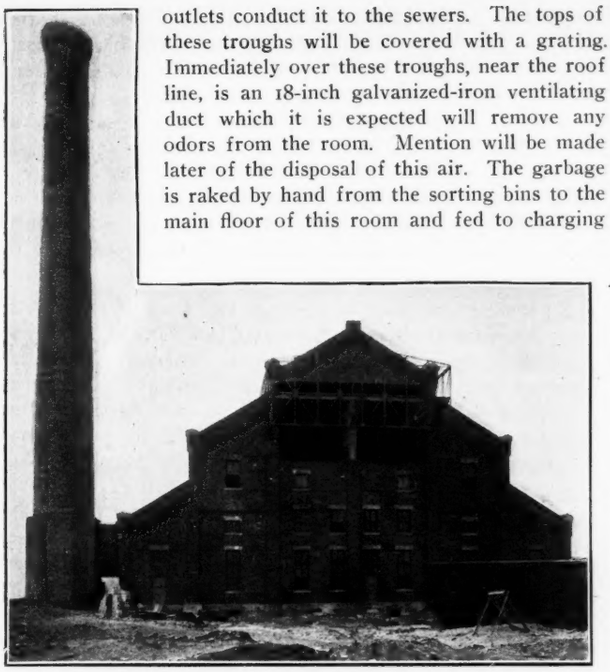
The loaded rubbish wagons come down Erie Street and pass around the side of the plant to the rear, next the river. They are then backed over any one of four pits, in which are located metal boxes into which the wagons are dumped. Each wagon holds about one and one-half yards and each box is designed to hold two wagon loads.

The garbage wagons, which are provided with tight metal bodies, are brought to the front of the building and the boxes are removed by cranes. At the top of the building are two crane runways extending the full length of the building and each about 18 feet wide. At either end of the building these runways have been extended outside far enough so that the cranes can be run out to pick up the full boxes of refuse, which they will elevate to the top of the building and dump into any of six mixing bins. These metal wagon bodies are built solid with one end sloping, and to dump them that end will be lowered.

The mixing bins are each about 12 feet wide and 36 feet long. The floor of the bins rises from both sides to the center at an incline of about one to four. Both ends of the bins are open. At the ends of each bin, or near the main floor level, troughs about 10 by 10 inches are formed. These troughs will catch any liquid which may be in the refuse and by means of pipe



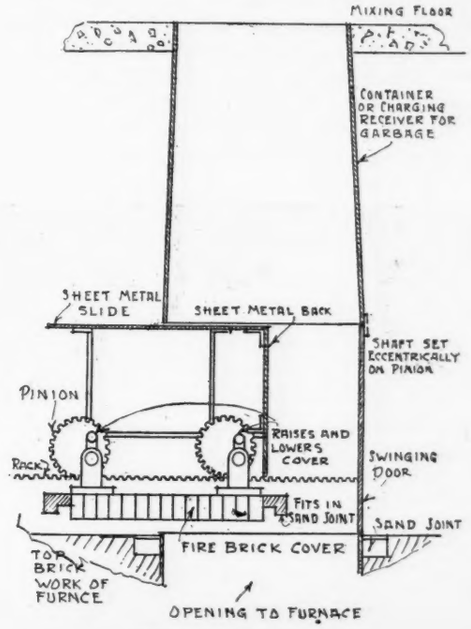
VIEW DOWN CENTER OF BUILDING, BETWEEN UNITS



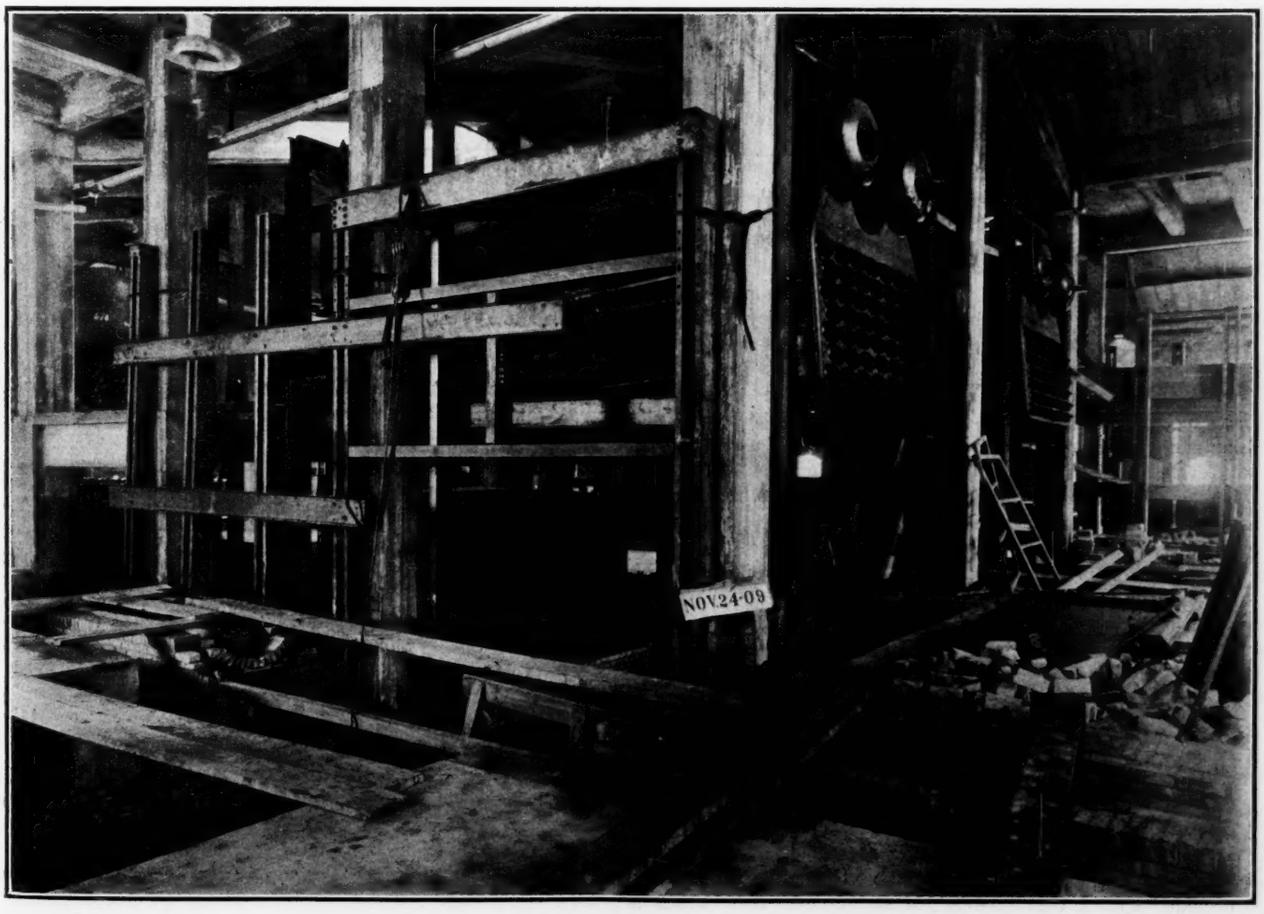
FRONT VIEW. CABLE RUNWAY WHICH HANDLES GARBAGE

outlets conduct it to the sewers. The tops of these troughs will be covered with a grating. Immediately over these troughs, near the roof line, is an 18-inch galvanized-iron ventilating duct which it is expected will remove any odors from the room. Mention will be made later of the disposal of this air. The garbage is raked by hand from the sorting bins to the main floor of this room and fed to charging containers. There are six of these to each furnace unit. One of these containers full forms a complete charge for the grate.

One of the very ingenious devices about the plant is the arrangement for discharging the contents of the containers into the furnaces without allowing any odors to escape. This same scheme prevents the admission of air at other times. The device consists of a double plate or slide with a distance of about two feet between an upper and a lower horizontal plate. These form the top and bottom of a light truck, which is carried by pinions rolling like wheels on two horizontal racks. The upper, sheet metal slide forms the bottom of the "container" or charging receiver. When this is directly under the feed hole the container is filled with refuse from the mixing floor. At the same time the lower plate, which is lined on the under side with fire brick, covers tightly the furnace opening, a flange



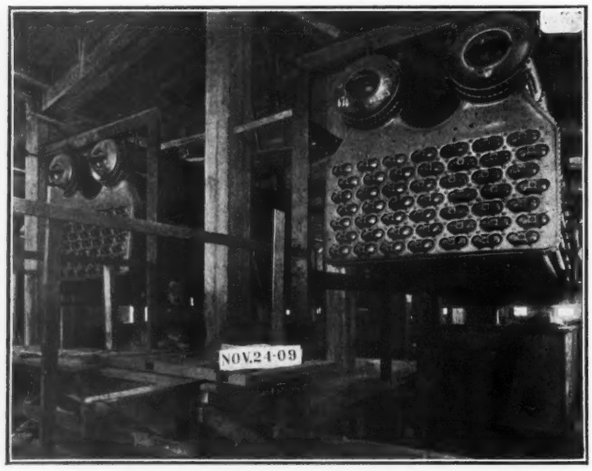
SKETCH OF CHARGING DOOR



BOILERS READY FOR WALLING IN. DUCT AT LOWER LEFT HAND

around its circumference resting in a bed of sand and forming a tight joint. This lower cover is suspended from pins set eccentrically in the pinions, the pins being at their lowest position when the cover is in place. When the truck is drawn aside the eccentric pins on the pinions raise the lower cover so it will clear the bed on which it rested. A swinging door drops into place behind the truck, and a plate on the rear of the truck closes the opposite side of the charging chute, to prevent the escape of gases. This withdrawal of the truck allows the refuse to drop into the furnace.

These so-called doors are operated by means of chains and sprockets from the floor of the clinker room. When the doors are closed a rim around the outside fits down onto a bed of sand and forms a tight joint. When they are open metal sides to the chute prevent the escape of gases. However, to collect any gases which might escape, a line of 30-inch



BOILER READY FOR WALLING IN

galvanized iron pipe with suitable openings in it is provided to carry them away. This is connected to exhaust fans in a similar manner to the line in the mixing room.

The main floor, or clinkering room as it is called, contains four destructor units of six grates each, four boilers, and the necessary auxiliary apparatus consisting of pumps, engines, generators, etc. Two units are set along each side of this floor with a wide aisle between their fronts and the side walls. Each unit is made up of two furnaces with a combustion chamber between them and an air duct at the back. It will occupy a space of 42 feet x 14 feet 6 inches. Back of each unit and near the center of the building is set a 200 hp. Erie City water tube boiler which is connected to the furnaces. At the front of the building in the center is an office and lavatory. At the rear of the building in the corresponding space is the machinery room.

As the refuse is fed from the containers it drops onto a drying hearth at the back of the furnace. Each furnace is made up of three sections, divided but not separated by a low wall or ridge, and there is a drying hearth for each section. The drying is accomplished by the heat of the furnace and by the hot gases coming from the combustion chamber, as will be explained later. After the refuse has dried sufficiently it is raked forward onto the grates, where it is set ablaze by and burns with material that was there before it. The grates of the furnace are of iron with comparatively small spaces between the bars. The material is supposed to burn to a more or less hard clinker, and after a sufficient amount has been burned in a section the clinker is broken up by bars and raked from the doors in front, where it drops through holes in the floor to cars in the basement beneath. After a section has been cleaned a new charge of dried refuse is raked onto the grates and is ignited by the heat from the other sections. Each section is provided with a counter-weighted sliding iron door which is clamped tightly when closed so that no gases can escape. Beneath the burning grates is an ash pit into which some of the burned material may drop and which is provided with door so that any so dropping may be removed. This pit also serves to distribute the air blast evenly under the grates.

In the basement beneath the clinkering floor a narrow-gauge track completely encircles the foundations of the furnaces. At each corner of the building are turn-tables so that cars can be taken under either row of furnaces. These tracks also lead outside the building so that the clinker can be taken outside for final disposal. Metal dump cars made by the Youngstown Car Company are used.

On a mezzanine floor between the two rows of furnaces are four American Blower Company's 48-inch Sirocco fans driven by vertical engines built by the same company. These fans draw air from the building through the ventilating pipes already mentioned. Ducts lead the air from the fans through heaters, one for each furnace. These heaters will consist of metal tubes placed in the second pass of each boiler below the boiler tubes, where they will be subjected to the heat of the furnace gases. Here the air will be heated to a temperature of 300°, and will then be led through a conduit to the ash pit beneath the grates and passed through the fire to assist in the combustion. In this manner all foul air which may escape to the building is conducted back to the furnaces and is burned so that no noxious odors will escape from the building. Back of the drying hearth of each section or cell is a checker work of brick which connects with a duct running to the combustion chamber. In case the refuse has a large percentage of garbage and is therefore very wet, hot gases can be brought from the combustion chamber and passed through the garbage. A steam jet is provided for drawing the gases to each cell.

The hot gases leaving the furnaces are conducted through flues to the boilers, where they act in a similar manner to the gases under any boiler. The minimum temperature allowed in the operation of the furnaces is 1,250° F., which is below the temperature usually found in boiler practice. The heating surface of the boilers is based on this temperature and is somewhat larger than boilers of this capacity ordinarily have, there being ninety-eight tubes each four inches in diameter and 18 feet long. The contractors have guaranteed that there will be maintained an average temperature of 1,500° F. in the combustion chamber and that 1.1 pounds of water will be evaporated from, and at, 212° F. per pound of average annual refuse burned. On leaving the boiler the gases pass through a brick flue to the stack previously mentioned.

In the machinery room are located two 7½ x 5 x 10-inch Blake feed water pumps. These will usually take their feed from the city mains, but can take it from the lake if necessary. The pumps are cross-connected so that either one or both the pumps can feed the boilers. Here also are two Shepard vertical cross-compound engines direct-connected to 50-kw, 240-volt, direct-current generators manufactured by the Allis-Chalmers Company. These generators will supply current for lighting the building and operating the cranes. However, the steam consumption of this apparatus will not be anywhere near the total amount available when the full capacity of the plant is realized, and some one of the plans considered in the report previously mentioned will undoubtedly be carried out. There is no space in the present building for the installation of additional machinery and when the time comes for its use an additional building will be constructed.

Messrs. Hering and Fuller, of New York, are the engineers representing the city in the construction work, and Mr. Samuel A. Greely is the resident engineer. The Power Specialty Company of New York, builders of the successful plant at Richmond Borough, New York, are the general contractors for the work. Their bid was as follows: Excavation, 52½ cents per cu. yd.; piling, 24.15 cents per lin. ft.; concrete, $6.04 per cu. yd.; steel reinforcement, 2½ cents per pound; these being estimated to total $16,654.25. For the furnaces, combustion chambers, etc., $132,267; storage hoppers, floors, etc., $15,960; cranes, generators, scales, etc., $9,503; a total of $174,384.25.

SKATING RINK ON A RESERVOIR

Rink for Roller and Ice Skating on Top of Covered Reservoir at Reading, Pa.—Provision for Unbalanced Thrusts—Construction Details

In our issue of April 20 reference was made to the covering of the Penn street reservoir at Reading, Pa., the same to be used as a roller and ice skating rink. Bids for this work were received June 22, 1909, and the work is now approaching completion.

The reservoir is a double one which has been in use as a distributing reservoir for years. The north basin is rectangular, 255 x 129 feet on top; the south basin is a trapezoid, with the parallel bases 182 and 124 feet, respectively, and the length 213 feet. The north basin was about 15 feet deep and the south basin 18 feet, with side slopes of 1¼ to 1. The interior was lined with puddle, about 18 inches thick on the bottom and 12 inches on the slopes, the latter being covered with about 18-inch stone laid dry.

The work now under way includes excavating a berme about 8 feet back from the face of the stone lining and 9 feet below the top of the reservoir, entirely around each basin; this to serve as the skew-back for the roof arches. Piers were built to support the groined arches, 136 in the north basin and 138 in the south, spaced 14 feet between centers. The piers are 2 feet square, resting on bases 6 feet square, and were built up 7 feet above the floor in the north basin and 12 feet in the south and deeper one, which is 18 inches above the spring line of the arches. Their tops were left with four faces lying in the arch radii, each face containing a groove about one-third the width of the face, 2 inches deep and with side slopes of 1:3. On the piers rested groined arches, circular, 6-foot radius, 6 inches thick at the crown, increasing to 12 inches where they merge at the junctions. The arches along the outside, where they rest upon the earth, increase to a footing about 4 feet thick. As it was feared that skaters might so group as to produce unbalanced thrusts on the piers, each pier was braced to the four surrounding it by concrete struts at the springing line; these being 10 inches wide, flat on top and with the under side arched with a rise of 12 inches, and 12 inches thick at the crown.

The puddled bottom was leveled off and covered with 5 inches of concrete. The stone lining was cleaned off and the joints cleaned out. It was then plastered to a surface flush with the stones, in horizontal strips 18 inches wide. After each strip had been plastered and set, 1:1 grout was poured into open joints just above, to fill the interstices behind the plastering. Where piers rested on the slopes the plastering was not brought out to the face of the stones, but these were allowed to project to hold the piers from slipping; in addition to which the pier footing was carried down to the foot of the slope. Other pier footings rested directly on the old puddle bottom.

At the low points or pockets between the roof arches 2-inch weep holes were carried through the arches approximately along radial lines. Over these gravel will be placed by hand, graded from 3 inch to 1/16 inch; on top of which will be placed sand, leveled off even with the tops of the arches. Above this will be about 2 feet of boiler cinders, thoroughly tamped or rolled, resting on which will be the skating floor, of concrete 6 inches thick with a sidewalk finish on top. Around this floor, on each basin, will be a coping 6 inches high and thick which will permit flooding for ice skating in winter. Each floor slopes on grades of from .003 to .005, to a central pocket, from which 6-inch w. i. drains lead to carry off rainwater or empty the rink in the spring.

In the center of each floor is a pavilion, consisting of a roof covering 66 x 24 feet, supported by two rows of posts, five in a row; each post resting over an arch pier. The pavilion floor 18 x 60 feet, is raised 6 inches above the skating floor, and is of concrete. The columns, trusses and braces are of steel, covered with two coats of Dixon's Graphite paint. The roof is covered with W. H. Mullins Company copper tiling. In the center of each pavilion is a ventilator, similar to those used at the Bernhart reservoir and described April 20. Resting on the ventilator, with its dial about 4½ feet above the floor, is a height-of-water gauge. An 8-inch pipe leads from this down into the reservoir, in which a 7-inch copper ball float is suspended by a cord which passes around a wheel on the gauge spindle; the spindle also carrying a counterweight cord wound in the opposite direction.

All of the piers and arches are constructed of concrete mixed 1:2:4. The top paving consists of 5 inches of 1:2½:5 concrete, with a top surface of 1 inch of mortar, mixed 2 cement to 3 sand. The concrete is being mixed with a Chicago Concrete Mixer, size No. 1, and distributed in cars, pushed by hand on portable contractor's track. The centering is covered with ⅞ x 2-inch t. and g. lagging, painted with crude oil. The forms for the outside of the arch are made of boards blocked in position and held down by placing on them cement bags

PENN STREET RESERVOIR. PIERS COMPLETED AND CENTERING UNDER WAY

filled with sand. The cars used for distributing the concrete were used also for handling the material excavated in forming the bermes around the basins.

The arches were designed on the assumption of a live load (skaters) of 150 pounds per square foot. The side walls of the basins were given a soap and alum wash, as in the case of the Bernhart reservoir previously described. The specifications require that the north basin be completed first, filled with water and tested, and repaired, if necessary, until watertight.

The work is being done by Horace Fehr and James O'Rourke, of Reading. The prices of some of the principal items are: Excavation, 51 cts. per cu. yd.; 1:2:4 concrete, $5.58 per cu. yd.; 1:2½:5 concrete, $3.30 per cu. yd.; earth filling, 30 cts. per cu. yd.; cinder filling, 52 cts. per cu. yd.; plastering slope wall, 51 cts. per sq. yd.; portland cement, $1.33 per bbl. (cement is not included in the prices for concrete); both pavilions, complete, $3,522. The total was $52,992. The resident engineer is E. K. Cortright. The work was designed and is in charge of the engineer and superintendent of the Water Board, Emil L. Nuebling.

COST OF FIRE PROTECTION

Twenty Per Cent of Total Cost of Water Works Systems—Distribution Systems—Hydrants—Water Supply —High Pressure Systems

THE U. S. Geological Survey has just published a bulletin (Bulletin No. 418) discussing the tax on the country due to fires and the conditions which invite them. Among other items of cost it has considered that involved in the construction of water supply systems of a capacity sufficient to fight fires; in other words, the difference between the cost of a system adequate for furnishing fire protection and that of one which would suffice for domestic and manufacturing purposes only. In conducting this investigation it received advice and suggestions from a number of engineers, including Prof. Geo. F. Swain and Messrs. John R. Freeman, John T. Fanning, Ben C. Adkins and Walter H. McFarland. "Careful statistical inquiry was made as to the additional cost of constructing and

COST OF CONSTRUCTION OF WATER WORKS SYSTEMS, 1907

CLASSIFICATION BY SIZE OF CITIES

	Cost per Capita	Total Cost of System	Amount Chargeable to Domestic Service	Amount Chargeable to Fire Service	Value of Established or Contemplated High-pressure Fire System
Total for United States	$27.21	$1,129,247,532	$883,575,856	$245,671,676	$22,191,388
100,000 and over	32.72	591,222,244	501,528,003	89,694,241	19,941,388
30,000 to 100,000	29.06	184,803,174	141,922,615	42,880,559	2,250,000
5,000 to 30,000	23.60	235,718,456	160,973,462	74,744,996	.....
Under 5,000	16.59	117,503,268	79,151,776	86,351,492	.....

	Cost of Entire Distributing System	Total Tons of Pipe	Distributing System Chargeable to Domestic Service	Tons of Pipe, Domestic	Distributing System Chargeable to Fire	Tons of Pipe, Fire
Total for United States	$468,022,552	7,097,800	$340,785,884	5,080,873	$127,236,668	2,016,927
100,000 and over	223,965,694	2,940,147	172,885,262	2,124,536	51,080,432	815,611
30,000 to 100,000	86,195,257	1,696,756	62,772,404	1,261,173	23,422,853	435,583
5,000 to 30,000	102,127,820	1,695,237	67,167,220	1,174,753	34,960,600	520,484
Under 5,000	55,733,781	765,660	37,960,998	520,411	17,772,783	245,249

	Source of Water Supply	Source of Water Supply, Domestic	Source of Water Supply, Fire	Number of Hydrants	Number of Hydrants, Fire Service	Cost of Hydrants, Fire Service
Total for United States	$609,272,192	$542,789,972	$66,482,220	420,394	350,152	$29,761,400
100,000 and over	339,069,350	326,642,741	10,426,609	130,366	82,462	8,246,200
30,000 to 100,000	91,276,397	79,150,211	12,128,186	70,756	63,494	5,079,520
5,000 to 30,000	124,089,798	93,806,242	30,282,556	131,713	118,773	9,501,840
Under 5,000	54,835,647	41,190,778	13,644,869	87,559	85,423	6,933,840

CLASSIFICATION BY GEOGRAPHICAL DIVISIONS

	Cost Per Capita	Total Cost of System	Amount Chargeable to Domestic Service	Amount Chargeable to Fire Service	Value of Established or Contemplated High-pressure Fire System
Total for United States	$27.21	$1,129,247,532	$$883,575,856	$245,671,676	$22,191,388
Middle and New England States	$32.19	623,221,159	513,311,626	109,909,533	18,198,388
Central States	20.35	308,163,578	222,577,226	85,586,352	2,493,000
Southern and Southeastern States	19.34	75,737,475	52,755,453	22,982,022	1,500,000
Rocky Mountain and Western States	63.77	60,509,780	48,402,652	12,107,128	.....
Pacific Slope States	28.96	61,615,540	46,528,899	15,086,641	.....

	Cost of Entire Distributing System	Total Tons of Pipe	Distributing System Chargeable to Domestic Service	Tons of Pipe, Domestic	Distributing System, Chargeable to Fire	Tons of Pipe, Fire
Total for United States	$468,022,552	7,097,800	$340,785,884	5,080,873	$127,236,668	2,016,927
Middle and New England States	221,338,976	2,897,936	167,435,756	2,117,261	53,903,220	780,675
Central States	158,648,237	2,747,968	111,455,490	1,925,764	47,192,747	822,204
Southern and Southeastern States	36,362,061	576,568	24,467,490	398,775	11,894,571	177,793
Rocky Mountain and Western States	25,920,674	457,639	18,979,767	323,624	6,940,907	134,015
Pacific Slope States	25,752,604	417,689	18,447,381	315,449	7,305,223	102,240

	Source of Water Supply	Source of Water Supply, Domestic	Source of Water Supply, Fire	Number of Hydrants	Number of Hydrants, Fire Service	Cost of Hydrants, Fire Service
Total for United States	$609,272,192	$542,789,972	$66,482,220	420,394	350,152	$29,761,400
Middle and New England States	374,435,475	345,875,870	28,559,605	123,855	108,879	9,248,320
Central States	134,312,281	111,121,736	23,190,545	186,730	148,496	12,710,060
Southern and Southeastern States	34,619,874	28,287,963	6,331,911	40,540	37,090	3,255,540
Rocky Mountain and Western States	30,903,186	29,422,885	1,480,301	46,894	45,249	3,685,920
Pacific Slope States	35,001,376	28,081,518	6,919,858	22,375	10,438	861,560

maintaining city water supplies required for protection against conflagration above the cost requisite to proper domestic supply, street sprinkling and the incidental fire service necessary to restrict a fire within the building in which it originates. . . . Five thousand seven hundred blank reports were mailed to engineers and superintendents of water works in an endeavor to obtain information with respect to the cost of constructing each plant, the amount chargeable to domestic service, and the amount chargeable to fire service. . . . One thousand five hundred replies were received, only a small percentage of which were complete enough for use in tabulation. The total cost of such water supplies was therefore obtained from the Census Reports on Municipal Finances for cities having a population of over 30,000 and owning water works; the remainder of the data were obtained from the Spectator's Year Book."

The total cost of water works systems in the United States, as thus determined, was segregated to show the total cost in each of five geographical districts, as the cost differs greatly in different sections of the country. Apparently no distinction was made between gravity and pumping supplies, and in fact the question blank sent out did not include any question as to this. A further subdivision was made of the cities according to population, the classification being that shown in the accompanying table. The reports received from engineers and water works superintendents who gave in detail the information sought was classified in the same way, and the information thus obtained for each class or division was then assumed to apply to all cities in the corresponding classes and geographical divisions.

The results of the inquiry, although very incomplete, would indicate that, for the whole United States, an average of 22 per cent of the total expenditure for public water supplies is due to additional supplies necessary for protection against fires of such magnitude as may be propagated beyond the building in which they originate.

A tabulation of the figures thus obtained by the Geological Survey is given in the accompanying table. The total costs of the systems and the costs per capita are approximately correct, being derived from those for each city obtained by the Census Bureau.

LOCATION OF STREET SHADE TREES

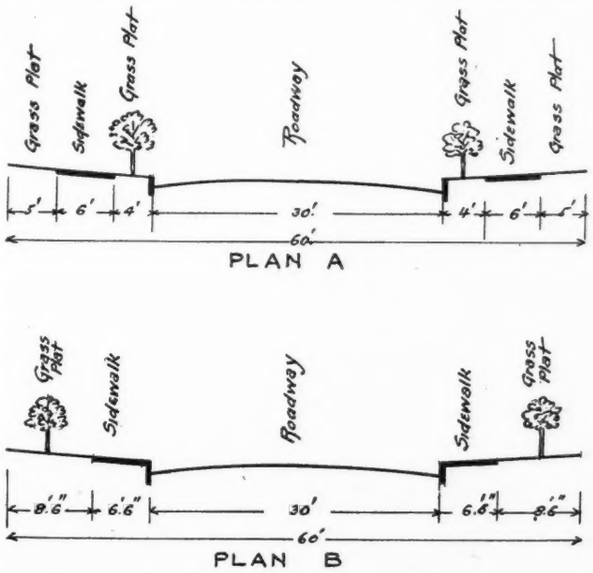
Editor, Municipal Journal and Engineer,
239 West 39th St., New York City.

Dear Sir:—Quite a controversy has come up between the owners of two tracts of land in this city as to the best methods of laying out sidewalks and grass plots. A dispute between these two property owners has caused quite a discussion between the City Council and the Park and Tree Commission, the latter claiming the right to plant trees on lines established by them, while our City Council has the right to locate sidewalks regardless of tree lines. The outcome of the situation is that the owner of each tract of land was allowed to plant trees and locate sidewalks as he saw fit. The different owners have decided on plans which I herewith enclose, marked A and B; owner A claiming to have the superior plan to owner B and the reverse.

Plan A is the usual custom of laying out sidewalks in this city, while plan B is a comparatively new idea for this city. Which of these plans do you consider the best?

It appears to me that plan B presents some good features, namely: 1—The sidewalk being next to the curb protects trees from animals. Most of our trees in the city are now protected with wire netting. 2—The space of four feet between sidewalk and curb, as shown on plan A, is too narrow, as tree roots will bulge the sidewalk and curbing when growing. 3—The four-foot grass plot as shown by plan A is not kept in order by property owners, they claiming that city should do it. These grass plots or strips are usually fenced in to protect them from parties crossing them; which fences are unsightly and are called by some "pig pens." 5—The combination curb and sidewalk is probably cheaper to construct.

I would like to learn also what other cities and city engineers think on this subject.



SKETCHES SHOWING TWO LOCATIONS OF SHADE TREES

This subject was discussed at the last convention of the American Society of Municipal Improvements, and while there were one or two city engineers who seem to favor the placing of the sidewalk next to the curb, the majority of those taking part in the discussion were of the opinion that the appearance of the street was much better when the trees were located between the curb and sidewalk. Most of the arguments suggested above were advanced and discussed, and it was also stated that many property owners desired to have the sidewalk as far from their houses as possible and their lawns increased by a larger part of the sidewalk space. On the side of the pedestrian, however, it was argued that the further he was from the roadway the less he received of dust and splashing mud and the safer the sidewalk would be from horses, protruding hubs of wheels, etc., especially for children. One engineer stated that when this matter was discussed for any particular street the citizens divided themselves into two classes —those living on the street who wished the sidewalk next to the curb, and those who walked along the street who wished the sidewalk separated from the curb by a parking strip. Other arguments are, that shade trees along the property line do not shade the roadway, and in the case of macadam roads allow them to dry out and ravel in hot weather. Also the wider separation of the trees destroys the beautiful arch effect given to a street by large spreading shade trees along the curb line. An additional objection to having the sidewalk next to the curb occurs when the corner of the curbstone is rounded with a radius of more than one foot, in that it is awkward stepping from the sidewalk to the street over the curved curb, and the width of roadway to be crossed is increased. This construction also makes practically necessary the locating of the storm water inlet back from the intersection of the curb lines in order that it may not be directly under the point where foot passengers must step into the roadway; and this generally involves two inlets instead of one directly at the corner, which is the most common practice.

The objectionable feature of the neglect of the parking strips by property owners and the difficulty of compelling them to keep the grass next to the curb trimmed and in order would seem to be a real objection where this condition exists; but in most cities in this section of the country as much attention is paid to this by the majority of occupants as to the lawn between the sidewalk and the property line. Where this is not the case it would seem as though education in civic pride was necessary. We see no reason why the property owner should not be compelled to do this in the same way that he is compelled to remove snow from the sidewalk or trim weeds on vacant lots—by having it done by city employees and charging it to the property owner when he neglects it. Other arguments were given in a discussion of this same subject in the MUNICIPAL JOURNAL AND ENGINEER for Dec. 1, 1909.

NEW SPECIFICATIONS FOR FIRE HOSE

New York Fire Department Adopts Those Recommended by Experts—For Both Cotton and Rubber Hose —Also Nozzles and Couplings

AT the request of Mr. Rhinelander Waldo, Commissioner of the Fire Department of New York City, a committee composed of representatives of the National Board of Fire Underwriters, the Merchants' Association, the Department of Finance and the Fire Department have for some time been formulating specifications for fire hose, and such specifications have just been adopted by the Fire Department. As they represent the best judgment of perhaps the best informed men in the country on this subject, they will undoubtedly prove of interest to Fire Departments and city officials interested in the purchase of fire hose in other cities as well. The specifications are divided into two parts, one for cotton rubber-lined hose and the other for all rubber hose. The specifications in full, except where otherwise stated, are given below:

HOSE SPECIFICATIONS OF THE NEW YORK CITY FIRE DEPARTMENT.

Part 1.—Cotton Rubber-Lined Hose

1. SIZE.—These specifications cover 2½-inch, 3-inch and 3½-inch hose.

2. MARKING.—The name of the manufacturer and the month and year of manufacture to be stenciled upon every piece of hose, twice in each 50-foot length, with BLACK INDELIBLE LETTERS, ONE INCH IN HEIGHT, these marks to begin twelve inches from the couplings.

3. COTTON FABRIC.—Note.—It is not the intention to bar under these specifications any form of fabric which is not accurately described as "single jacket," "two jackets or plies, separate or interwoven," or "three jackets or plies, separate or interwoven." The weights given in section "c" shall apply to such other forms of fabrics as may by virtue of strength and elongation fall within the single, double or triple-jacketed classes. See Sections 8 and 9.

(a)—To be even and firm in texture throughout and free from all injuries or unsightly defects, or defects of any kind except such trifling ones as are incident to the best practical manufacturing.

(b)—The yarn from which fabric is woven is to be spun and twisted in the best manner from selected cotton; the staple of which shall not be less than 1 inch in length. Its minimum strength when sixty yards (40 turns of 1½-yard reel) are tested on a Brown Bros. tester, shall be at least 12½% above Draper Standard for average strength. For instance, No. 12 yarn shall have a strength of not less than eighty (80) pounds.

(c)—The weight of 50 feet of fabric to be within the following limits:

Single jacket:
- 2½-inch not more than 35 pounds.

Two jackets or plies, separate and interwoven:
- 2½-inch not more than 45 pounds.
- 3-inch not more than 55 pounds.
- 3½-inch not more than 65 pounds.

Three jackets or plies, separate or interwoven:
- 2½-inch not more than 60 pounds.
- 3-inch not more than 75 pounds.
- 3½-inch not more than 85 pounds.

4. (a)—RUBBER LINING shall contain not less than 40%, by weight, of fine Para rubber, or a mixture of fine Para and Upriver Coarse Para rubbers, the proportion of the fine in this mixture to be not less than two-thirds. The compounding materials shall contain no substance injurious to rubber.

(b)—To be well and properly cemented to the cotton fabric with cement of the best quality, to secure adhesion, durability and at the same time such freedom from corrugations as it is possible to obtain with the best methods of manufacture.

(c)—The tubes to be lap-jointed and to have the lap as small and neat as is consistent with the best workmanship.

(d)—The tubes to be made up of not less than three calendered sheets, the intention being to remedy in three plies the defects that may occur in one or two.

(e)—Thickness of tubes, exclusive of cement or backing, to be within the following limits:
- 2½-inch and 3-inch hose not less than No. 17 Stubbs' wire gage (.058″) nor greater than No. 15 Stubbs' wire gage (.072″).
- 3½-inch hose not less than No. 15 Stubbs' wire gage (.072″) nor greater than No. 13 Stubbs' wire gage (.095″).

(f)—Cement or other backing not to exceed No. 22 Stubbs' wire gage (.028″) in thickness.

5. DIAMETER—The internal diameter of hose shall not be less than 2½ inches, 3 inches and 3½ inches, respectively.

6. (a)—COUPLINGS to have dimensions according to gage to be furnished by the New York Fire Department.

The internal diameter of couplings shall not be less than 2½ inches, 3 inches and 3½ inches throughout.

(b)—To be made, finished and fitted in a workmanlike manner throughout.

(c)—To be of the expansion ring pattern and of the best form to resist the strain of expanding the binding ring in the couplings; and must have a long tail part sufficient for expansion rings of the following lengths:
- 2½-inch not less than 1½ inches.
- 3-inch not less than 1¾ inches.
- 3½-inch not less than 2½ inches.

All expansion rings must have smooth and rounded edges to prevent rupture of the tube at the couplings.

(d)—To be made of an alloy of copper, tin and zinc (and lead if desired) of the following proportions: Not less than 82% copper, not less than 7% tin, not more than 7% zinc, not more than 3% lead.

(e)—The weights of the couplings, including rings, to be not less than the following: 2½-inch not less than 5½ pounds; 3-inch not less than 8 pounds; 3½-inch not less than 12 pounds.

(f)—To be stamped with the name or initials of the maker of the couplings and the month and year of manufacture in letters not less than ¼ inch high.

(g)—To be provided with rubber gasket of best quality, accurately fitted.

(h)—To have a rubber washer at least 3-16 inch in thickness in the coupling inside each expansion ring, to keep end of the cotton fabric dry, and with inside diameter not less than that of coupling.

7. WEIGHT AND FLEXIBILITY: Note.—It is not the intention to bar under these specifications any form of hose which is not accurately described as "single jacket," "two jackets or plies, separate or interwoven," or "three jackets or plies, separate or interwoven." The weights given in Section "a" shall apply to such forms of hose as may by virtue of strength and elongation fall within the single, double or triple-jacketed classes. See Sections 8 and 9.

(a)—The weight of 50 feet of finished hose, without couplings, to be within the following limits:

Single jacket: 2½-inch not more than 50 pounds.

Two jackets or plies, separate or interwoven: 2½-inch not over 60 pounds; 3-inch not over 80 pounds; 3½-inch not over 110 pounds.

Three jackets or plies, separate or interwoven: 2½-inch not over 75 pounds; 3-inch not over 100 pounds; 3½-inch not over 130 pounds.

(b)—For permissible weights with couplings attached add weights for couplings appearing in Rule 6.

(c)—Hose must be flexible and easily coiled.

8. STRENGTH. (a)—Every length of hose shall be tested by the manufacturer after coupling, but before delivery, for purpose of detecting imperfections and to insure proper attachment of couplings, to the following pressures:

Single jacket, 200 pounds.

Two jackets or plies, separate or interwoven, 300 pounds.

Three jackets or plies, separate or interwoven, 300 pounds.

Hose to be carefully dried before shipment.

One length of hose in every five shall be subject to the following pressure tests:

Single jacket, 300 pounds.

Two jackets or plies, separate or interwoven, 400 pounds.

Three jackets or plies, separate or interwoven, 400 pounds.

Sample full lengths must show average bursting pressures as follows:

Single jacket, not less than 500 pounds.

Two or three jackets or plies, separate or interwoven, not less than 600 pounds.

The above pressure tests to be made when the hose is lying straight, or when any portion of the length is bent in a curve, the radius of which is 2¼ feet.

9. ELONGATION. The elongation between 10 and 400 pounds shall not exceed the following amounts:

Single jacket, 13% (78 inches in 50 feet).

Two jackets or plies, separate or interwoven, 9% (54 inches in 50 feet).

Three jackets or plies, separate or interwoven, 9% (54 inches in 50 feet).

10. TWIST. (a)—Any undue amount of twist is looked upon as showing inferiority in weaving. Hose to show but little tendency to twist at 100 pounds, and up to 400 pounds the twist shall not exceed the following amounts:

Single jacket, 21½ degrees per foot (equals 3 turns in 50 feet).

Two jackets or plies, separate or interwoven, 14½ degrees per foot (equals two turns in 50 feet).

Three jackets or plies, separate or interwoven, 14½ degrees per foot (equals two turns in 50 feet).

(b)—The twist to be in such direction as to tighten rather than loosen the couplings.

(c)—While undergoing the pressure test of 400 pounds the hose shall not warp more than 18 inches from a straight line drawn from center to center of couplings.

11. TESTS OF RUBBER LINING. (a)—The breaking strength to be not less than eleven hundred (1100) pounds per square inch.

(b)—The length of breaking point to be not less than six times the initial length.

(c)—Place two lines on the test sample 2 inches apart and at right angles to the direction of pull. Stretch to twelve (12) inches and hold in that position for ten (10) minues. Ten (10) minues afer release the distance between the two lines shall not exceed 2⅜ inches.

(d)—The compound used shall not contain more than 4% of sulphur, exclusive of that which may be contained in the mineral matter as sulphates.

(e)—The organic acetone extract shall not exceed 5% of the gum present.

(f)—The saponifiable matter extracted by alcoholic potash after the acetone extraction has been made shall not exceed 2% of the gum present.

Part 2.—Rubber Hose

1. SIZE. As in Part I.

2. MARKING. The name of the manufacturer and the month and year of manufacture, to be vulcanized in the cover in prominent characters, and in a color which will contrast with that of the hose, twice in each 50-foot length, letters and figures showing date of manufacture to be not less than ONE-HALF INCH IN HEIGHT, and to be near the couplings.

3. COTTON DUCK. (a)—To be of selected cotton, the staple of which shall not be less than one inch in length, having the following minimum breaking strengths per inch:

Across filler threads not less than 300 pounds.

Across warp threads not less than 250 pounds.

(b)—To be of not less than the following number of plies:
- 2½-inch hose, 4-ply.
- 3-inch hose, 5-ply.
- 3½-inch hose, 6-ply.

(c)—The weight of duck for 50 feet of hose to be within the following limits:

2½-inch not more than 25 pounds.
3-inch not more than 32 pounds.
3½-inch not more than 40 pounds.

4. RUBBER LINING AND COVER. (a)—As in Part I.

(b)—To be well and properly united to the plies of cotton duck so as to secure adhesion and durability.

The friction shall be such that when a one-inch section of the hose is placed on a horizontal freely turning mandril, with a weight of 20 pounds applied vertically to the free end of the duck, the layers shall not separate more than two inches in ten minutes.

(c)—As in c and d, Part I.

(d)—As in e, Part I.

(e)—Thickness of the cover to be uniform and not less than No. 19 Stubbs' wire gage (.042") for all sizes.

(f)—Ends of hose to be capped with ⅛-inch of rubber to protect duck against moisture.

(g)—The cover shall not have a raised lap joint.

5. DIAMETER. As in Part I.

6. COUPLINGS. As in a to g, inclusive, Part I.

7. WEIGHT AND FLEXIBILITY. (a)—The weight of 50 feet of finished hose without couplings to be within the following limits:

2½-inch hose, 4-ply, not over 60 pounds.
3-inch hose, 5-ply, not over 80 pounds.
3½-inch hose, 6-ply, not over 110 pounds.

(b)—For permissible weights with couplings attached, add weights for couplings appearing in Rule 6.

(c)—Hose must be flexible and easily coiled.

8. STRENGTH. (a)—Every length of hose shall be tested by the manufacturer after couplings but before delivery with 300-pounds pressure, for purpose of detecting imperfections and to insure proper attachment of couplings.

(b)—One length of hose in every five (5) shall be subject to a pressure test of 400 pounds.

Sample full lengths must show average bursting pressures not less than 600 pounds.

The above pressure tests to be made when the hose is lying straight or when any portion of the length is bent in a curve, the radius of which is 2¼ feet.

9. ELONGATION. The elongation between 10 and 400 pounds shall not exceed 6% (36 inches in 50 feet).

10. TWIST. (a)—Any undue amount of twist is looked upon as showing inferiority in manufacture. Hose to show but little tendency to twist at 100 pounds, and up to 400 pounds the twist shall not exceed 10½ degrees per foot of original length. (Equal to 1½ turns in 50 feet.)

(b)—The twist to be in such direction as to tighten rather than loosen the couplings.

(c)—The hose shall not warp out of shape under pressure.

11. INCREASE IN DIAMETER. Under a 400-pound pressure the increase in diameter of hose shall not exceed the following:

2½-in. hose not over ⅛ inch.
3-inch hose not over 3/16 inch.
3½-inch hose not over ¼ inch.

12. TESTS ON RUBBER LININGS AND COVERS. (a)—As in 11 a, Part I.

(b)—As in 11, b, Part I.

The length at breaking point of the cover to be not less than five times the initial length.

(c)—Place two lines on the test sample 2 inches apart, and at right angles to the direction of pull. For the lining stretch to twelve (12") inches; for the cover stretch to ten (10"); hold in that position for ten (10) minutes. Ten (10) minutes after release the distance between the two lines shall not exceed 2⅜ inches.

(d)—As in 11 d, Part I.

(e)—As in 11 e, Part I.

(f)—The alcoholic potash extract shall not exceed 2% of the gum present.

TRACTION ENGINES IN ROAD WORK

THE use of traction engines for hauling heavy loads has been more or less common in England for a number of years, but has by no means come into general use in this country. During the past year or two, however, contractors have apparently been realizing the advantages of this method of hauling. In the Los Angeles aqueduct work, as described in our issue of Feb. 17, 1909, the traction engine played a most important part in the carrying of materials over the miles of trackless country to the more distant portions of the work.

In the East a few contractors have been trying the substitution of these engines for horses on work where large quantities of material are to be hauled over highways, road construction material especially coming under this head. Mr. J. E. Francis, of Punxsutawney, Pa., has been using a traction engine for macadam road work for two seasons, and in response to an inquiry from us gives the following information concerning his experience. The traction engine used by him was a single-cylinder, 22-horsepower engine, manufactured by the A. B. Farquhar Co., York, Pa. With this machine, which he purchased about two years ago, he hauled nearly 10,000 tons of crushed stone onto the different roads which he then had under construction in Somerset County, Pa. The hills on this work were very long and very steep, some exceeding a 15 per cent grade, but he experienced no difficulty in hauling over these a train of six to eight wagons, each loaded with nearly three tons of stone. The wagons used were bottom-dump wagons weighing about 2,400 pounds each.

His experience during that season was so satisfactory that he purchased two more traction engines for the following year, these, however, being of the double-cylinder type, designed especially for road hauling. With these engines, although they weigh but 10 tons, he was able to increase the load to 12 wagons. Last summer he began the construction of about six miles of road at Oakland, Md., on which work he gave the two new machines a very thorough trial as to both hauling power and wearing quality. The roads traveled over in this work were similar to those in Somerset County, with several long and steep hills, but no difficulty was found in hauling a train of 12 wagons loaded with crushed stone to the extreme end of the work, a distance of six miles from the railroad siding where the wagons were loaded, making the round trip in less than five hours, or at a rate of about 2½ miles an hour. After four months of continual use on this work the engines were found to need but little repairing to be put in good condition for the coming season.

EXCAVATING MACHINERY IN SEWER WORK

THE use of excavators for digging sewer trenches has not become very common in Eastern cities, but one of these was used last year in Erie, Pa., by Joseph McCormick and Brothers, of that city, which is said by City Engineer B. E. Briggs to have done very satisfactory work. No detailed record as to cost of operation was kept, but Mr. Briggs and Mr. L. Vincent Metz, Engineer in Charge of the Sewer Department,, have contributed the following information:

The principal difficulty encountered in using the machine was in keeping the ditch wall shored up when sand and gravel soil was encountered. In clay soil, where very little shoring is required, the best progress was made. It is believed that the record day's work was digging and laying pipe in 1,080 feet of trench, average depth 9½ feet, in nine hours. During this day's work a ¾-inch water service pipe crossing the trench was broken; but in later work such accidents were avoided by locating the service pipes ahead of the machine, generally by noting the position of the stops at the curb line, then digging down to the mains at this point and turning off the supply. Then, when the machine reached any supply pipe, the excavator or excavating arm was raised out of the way and the machine run ahead until it cleared the pipe; or else the pipe was cut and removed from the trench as soon as it was uncovered by the machine. The service pipes were left disconnected until the machine had passed, and ordinarily until the sewer was laid and the trench back-filled up to the height of such pipe.

The working force required to operate the machine was one engineer, one fireman and one operator, together with three other men working on or about the machine. About the smallest day's work was in gravel soil, and amounted to 250 feet in length, or about 208 cubic yards. The cost here was greater than in clay soil because of the instability of the gravel and the increased amount of sheathing required. The average daily run of the machine was about 500 lineal feet. The total amount of trench dug was 28,000 lineal feet, in which were laid 15, 12 and 9-inch sewers, the average cut being 10 feet and the average cost about 6½ cents per lineal foot of trench.

The City Engineer set all the sewer grades and gave the depths of cut and the work of the machine was done in such a manner that when it had passed there was practically no hand shoveling to be done preparatory to laying the pipe, a practically accurate grade being kept at the bottom of the trench. Backfilling followed close behind the machine and was done by hand labor. The excavator used was a No. 3 machine, manufactured by the Municipal Engineering & Contracting Company, of Chicago.

WATER PURIFICATION AT COLUMBUS

Plant of Thirty Million Gallons Capacity—Water Softening, Using Lime and Soda Ash—Coagulation by Use of Sulphates of Alumina and Iron—Rapid Sand Filters—The Plant and Its Operation

The water purification at Columbus, Ohio, which was completed and put into operation a little over a year ago, has received partial description a number of times in Municipal Journal and Engineer and elsewhere, but a complete description of the plant and some data concerning its operation have recently been given in a paper before the American Society of Civil Engineers by Mr. John H. Gregory, who was in charge of the construction. We give the following abstract of so much of Mr. Gregory's article as relates to the water purification works, for which and for the illustrations we are indebted to the Proceedings of the Society.

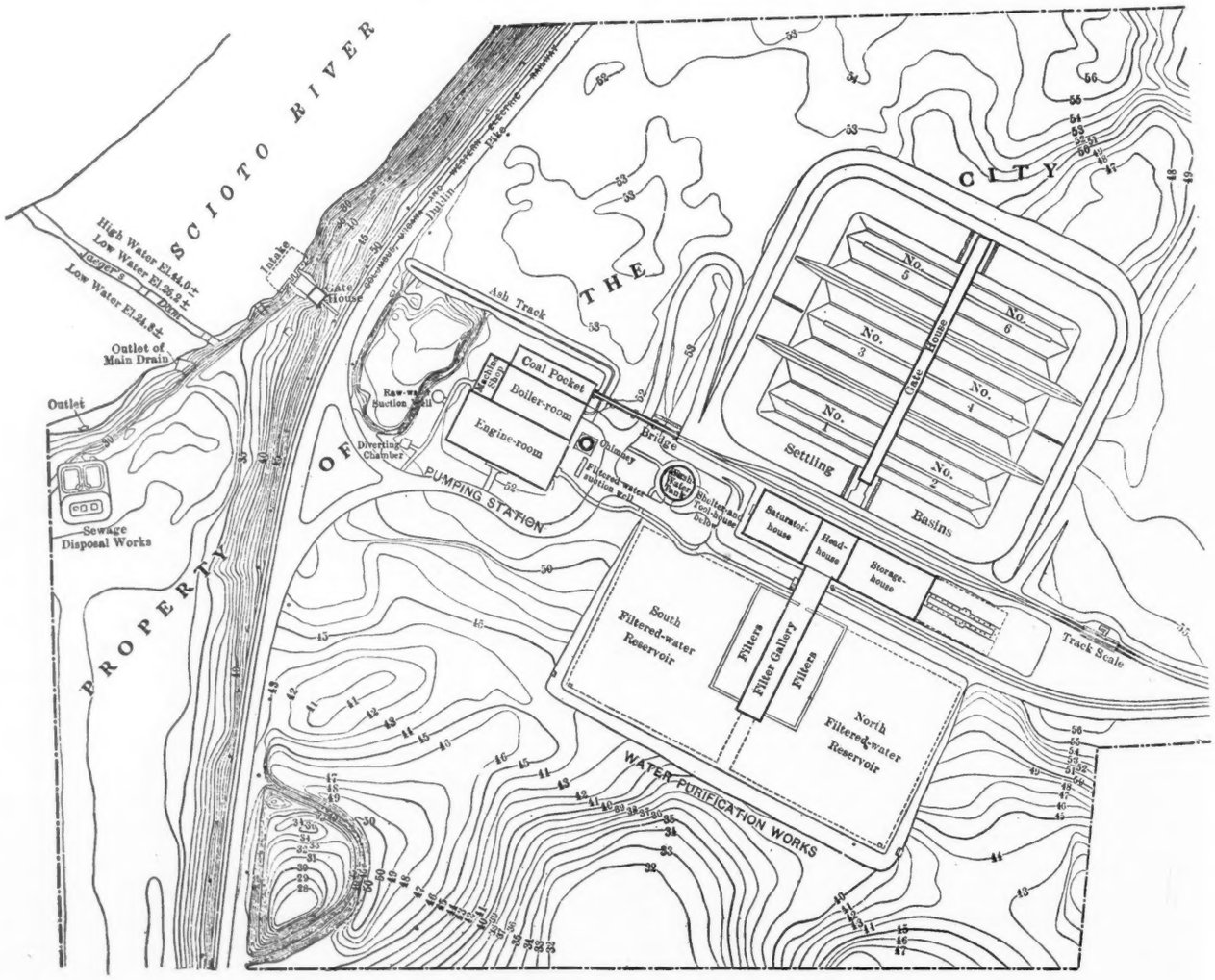
Columbus derives its supply from the Scioto river. The pumping station and water purification works are located on high ground on the north bank of the river about 4.5 miles below a dam, which raises the water level 30 feet and forms a storage reservoir. The raw river water is pumped by low lift pumps to the purification works, where it is softened and filtered and delivered to filtered water reservoirs, from which it flows to a filtered water suction well just north of the pumping station. From this well it is pumped through two lines of 36-inch cast-iron pipe about 4,900 feet long to a point opposite the old west side pumping station, about one mile below, where connections are made with existing distribution system.

Both pumping station and purification works are designed for an ultimate net normal capacity of 40 million gallons per day; but the pumping plant so far constructed has a capacity of but 20 million gallons per day and the purification works a capacity of 30 million gallons.

All water is metered. The raw water pumped to the purication works passes through a 48-inch Venturi meter to which is connected an indicator and chart recorder, a register and a manometer. The filtered water also passes through a 48-inch Venturi meter provided with register and manometer. All the various lines for supplying filtered water to the pumping station and purification works are metered, the water for these being drawn from the force mains below the Venturi meter.

The water purification combines softening and filtration, the filters being the so-called mechanical or rapid filters. The river water is hard and at times highly turbid and in periods of flood changes its character very rapidly from hour to hour; one especially troublesome feature being a very rapid increase in turbidity with a correspondingly rapid decrease in hardness. This has necessitated some departures from ordinary standard practice.

The chemicals used, lime, coagulant and soda, are slaked and dissolved on the third floor of the head house, which is the center of operations. Four dissolving tanks are provided, two for soda ash and two for coagulant. These are con-



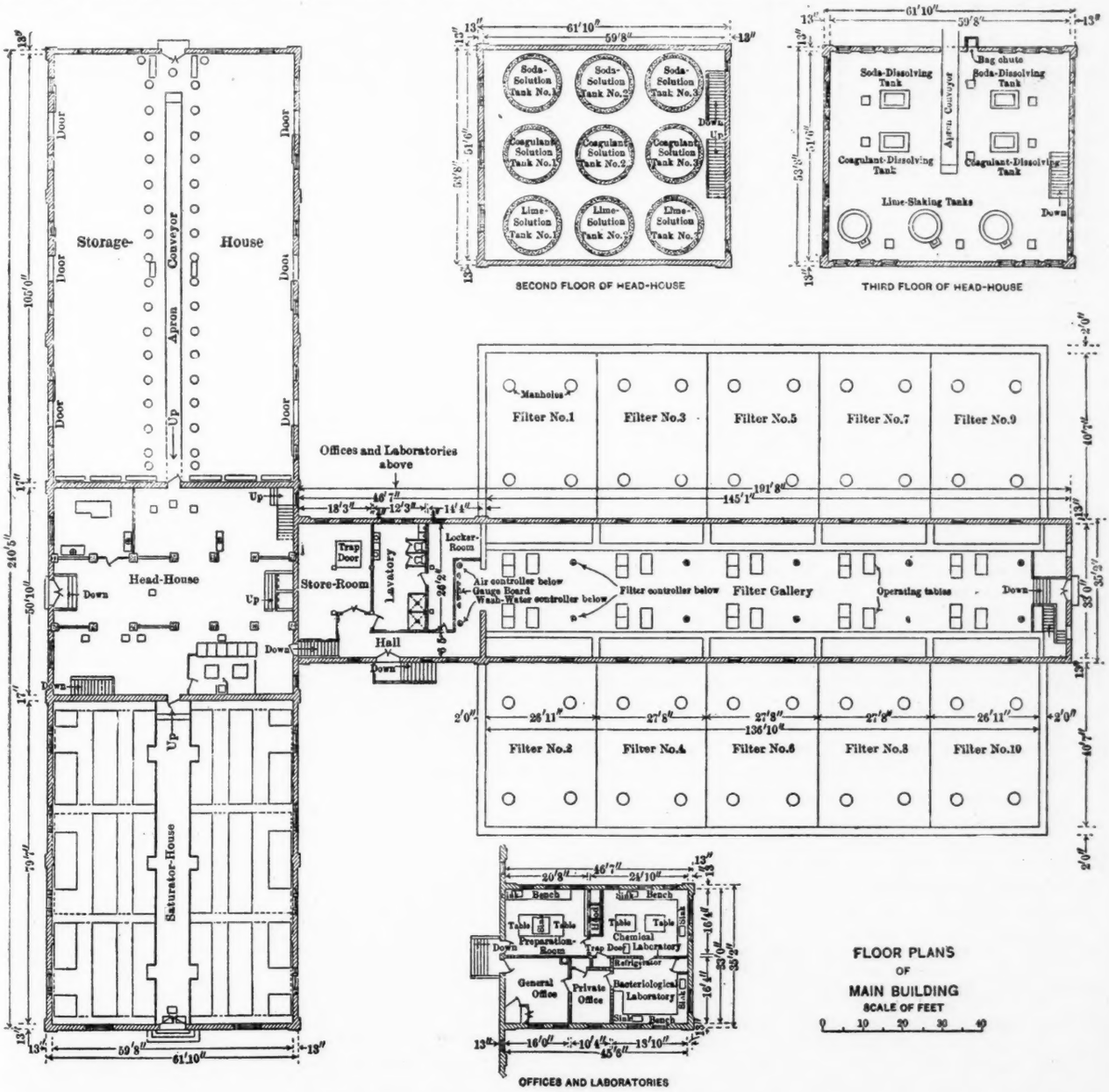
LAYOUT OF WATER PUMPING AND PURIFICATION WORKS

structed of concrete, rectangular in plan, 5 feet long, 3 feet wide, and 2 feet 8 inches deep. In the coagulant tanks the material to be dissolved is placed on a screen raised 3 inches above the floor and covering the entire width and nearly the entire length of the tank. At the inlet end a baffle extends from the bottom of the tank to the bottom of the screen, and at the outlet end a baffle extends from the bottom of the tank to within 8 inches of the top, above which is placed another screen. These cause the water, which can be heated by steam if desired, to pass up through the horizontal screen and the material resting upon it, then up and over the outlet baffle, passing through the screen at this point. The outlet from the tank is also protected by a removable cylindrical screen 3½ inches in diameter and 2 feet 2 inches long. All the screens and the baffles are of copper. The soda tanks are practically the same in arrangement, except that for the false bottom has been substituted an ejector-type heater to produce circulation. From the dissolving tanks the solutions pass to six large cylindrical tanks, three for each solution, on the floor below, where they are stored temporarily. These tanks are of re-inforced concrete 12 feet 6 inches in diameter and 11 feet 5 inches deep. The three solution tanks and two dissolving tanks for each solution are thoroughly cross connected by piping. In the solution tanks the solutions can be diluted by water and are agitated by compressed air to prevent stratification.

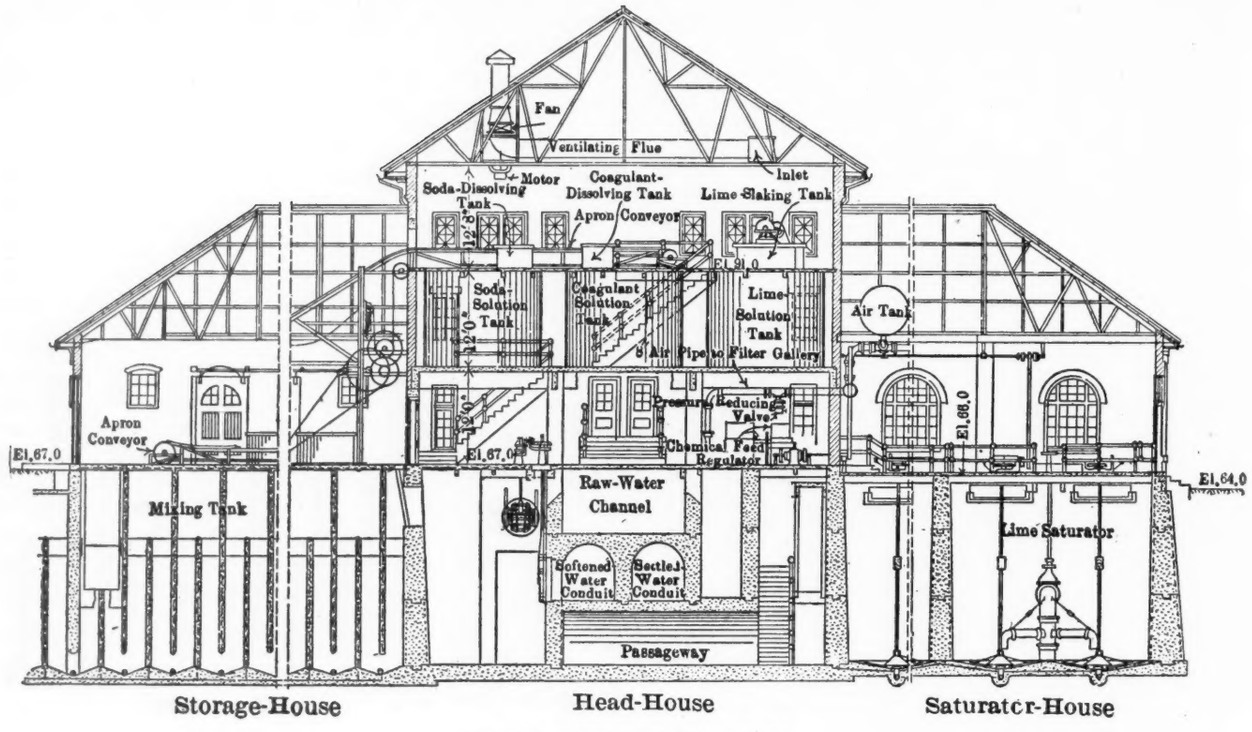
There are also on the third floor three lime-slaking tanks 6 feet in diameter and 2 feet 8 inches deep, in which are vertical rakes carried on horizontal arms for stirring up the lime during slaking; the rakes being driven by a 220-volt, 1½-horse-power Crocker-Wheeler variable speed motor. The slaked lime is discharged into a solution tank below each slaking tank, where it is diluted to the required strength; the milk of lime in this being agitated by horizontal paddles carried by a vertical shaft which is driven by the same motor which operates the rakes in the slaking tank. The three solution tanks are each 12 feet 6 inches in diameter and 11 feet 5 inches deep.

The chemical solutions are fed to the raw water automatically in proportion to the amount of this pumped, the regulation being secured by specially designed feed regulators provided in duplicate and operated by the difference between the head on the throat and up-stream end of a 48-inch Venturi meter located in the raw water force main just outside the head house.

The raw water from the river is first received in the sub-



FLOOR PLANS OF MAIN BUILDING



SECTION THROUGH BUILDINGS

structure of the head house, which is essentially a large gate chamber. On entering the head house the raw water is first admitted to the raw water channel, along each side of which are located the head house weirs. One portion of raw water passes over the lime weir, where milk of lime is added to it, and then flows to the lime saturators, where it is converted into lime water. Returning from the saturators the lime water passes through two lime water pipes into two large raw water chambers.

A second portion of raw water passes over another weir into the two raw water chambers just mentioned, where it mingles with the lime water, the two then flowing into the mixing tanks.

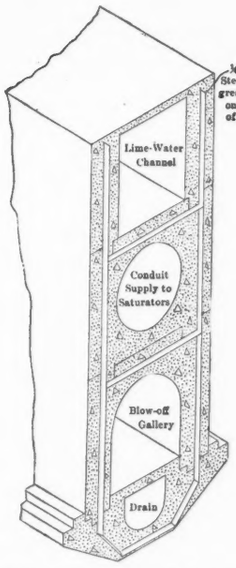
A third portion of raw water passes over the soda weir, where a solution of soda ash is added, after which the raw water and soda solution flow out through the soda channel and thence into the mixing tanks, where it mixes with the raw water already treated with lime water. It is in these mixing tanks that the softening reactions largely take place. From these the water is led through the softened water conduit back through the head house and out into the settling basins, where a large part of the suspended matter is deposited. From these it returns again to the head house through the settled water conduit, and from there it passes to the filter gallery.

In addition to the three weirs mentioned above, a fourth weir, known as the settling basin weir, is used when desired to discharge raw water from the raw water channel to be mixed with the softened water prior to filtration in order to eliminate traces of caustic alkalinity; the raw water after passing the weir flowing through a 24-inch pipe, which passes through the main division wall of the settling basins into the softened water conduit. Provision has also been made for by-passing the mixing tanks and admitting raw water directly into the softened water conduit leading to the settling basin. Also by the use of stop planks it is possible to by-pass the settling basins, the water flowing from the softened water conduit into the settled water conduit and thence to the filter gallery. In the latter case coagulant would be added to the raw water through a grid, placed in the settled water conduit.

The four weirs are all adjustable by the use of flash-boards, the settling basin weir for its full length and the other three for a part of their length. Thus each of the last three consists of a fixed and an adjustable portion, which permits of considerable flexibility in regulating the discharge. Of the lime weir about 5 feet is fixed and 6 feet adjustable; of the raw water weir about 23 feet is fixed and 6 feet 10 inches adjustable; of the soda weir about 6 feet 10 inches is fixed and 4 feet 7 inches adjustable; and of the settling basin weir the entire 4 feet 7 inches is adjustable. This was thought to be sufficient flexibility, but during the year or more of operation it has been found that such has not been the case and it is proposed to modify the construction to permit greater variations.

Each flash-board consists of a plate held on the outer end of an arm pivoted on a horizontal shaft, the arm, and thereby the plate, being raised or lowered by a rod extending up through the floor above. Each flash-board has a width of 5½ inches, except two which have a width of 2¾ inches. These flash-boards are adjusted for varying conditions of the raw water, and when once set are locked in position so that they cannot be changed without the knowledge of the person in responsible charge. The head on the weirs is about 0.45 foot for a flow of 30 million gallons per day and 0.55 foot for a flow of 40 million gallons. The devices for controlling the flow of water through the substructure, the regulators for controlling the rate of application of the chemical solution, the air compressor and the motors for driving the stirring machinery of the lime saturators are located on the first floor of the head house.

The six lime saturators are in a wing of the main building just south of the head house. The mixture of raw water and the milk of lime is brought from the head house through a circular conduit and enters the saturators through 20-inch cast-iron pipes, each of which branches into four 10-inch pipes. The milk of lime, rising slowly through the saturators, is diluted and flows over the weirs into the lime water channel and through this back to the head house and into the two large raw water chambers, where it mixes with the bulk of the raw water. The saturators are designed to produce 6,750,000 gallons of lime water per day with an upward velocity of 10 feet per hour. Each tank is 25 feet square and 20 feet deep and the bottom is in the form of four inverted cones, in the center of each of which is a 6-inch outlet for blowing off sludge. Each outlet is provided with a loose disk operated from above so

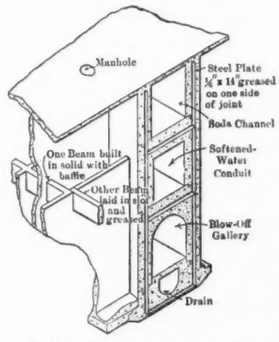


WALL BETWEEN LIME SATURATORS

that each cone may be drawn off separately. The outlets connect with pipes running to the drain below the floor of the blow-off gallery and each blow-off pipe is provided with an 8-inch quick-opening sluice gate. To prevent sedimentation and insure thorough mixing of the lime in the saturators there are four agitators in each, consisting at the bottom of conical hoods of ¼-inch steel plate, 4 feet in diameter and carrying two arms or paddles. The paddles are about 2 inches from the surface of the conical bottom and revolve at from 3 to 4½ revolutions per minute. The agitators are driven by vertical hollow shafts of 2-inch wrought-iron pipe which also carry paddles and are driven through bevel gearing by a shaft which receives its power from a 7½-hp variable speed 220-volt Crocker-Wheeler motor.

In a wing of the main building just north of the head house are the storage house and mixing tanks, the southern portion of the latter being directly below the storage house. There is a railroad spur on each side of the storage house arranged so that six cars may be unloaded at one time. The storage house comprises one large room 59 feet 8 inches wide and 105 feet long. Here are stored the chemicals, which are handled in bags of 100 pounds net each. From the foot of the storage house the bags are transported by Jeffrey apron conveyors to the third floor of the head house. The conveyor is driven by an 18-hp Crocker-Wheeler enclosed motor and can carry 12 bags per minute.

The two mixing tanks, in which the softening reactions largely take place, are of peculiar construction as they are highly baffled, the arrangement of the baffles being such as to tend to prevent sedimentation and keep the solids in suspension. They are each 204 feet long and 25 feet wide, with a water depth of a little more than 20 feet. The baffles are spaced 3 feet from center to center, and the 68 chambers or pockets formed by the lower baffles are drained by 6-inch quick-opening sluice gates. To prevent the possibility of the lower baffles being overthrown by water pressure on one side only each is provided with two 2 x 3-foot rectangular flap gates hung on bronze mounted hinges and heavy enough to keep the openings closed when there is not pressure on both sides. The dividing wall between the tanks contains three longitudinal passages, one above the other, the top one carrying the raw water and soda solution to the tanks, the middle one carrying softened water from the outlets of the tanks back to the head house and settling basins. The bottom passage provides access to the blow-off gates.


Manhole
Steel Plate ¼" x 14" greased on one side of joint
Soda Channel
One Beam built in solid with baffle
Softened-Water Conduit
Other Beam laid in slot and greased
Blow-Off Gallery
Drain

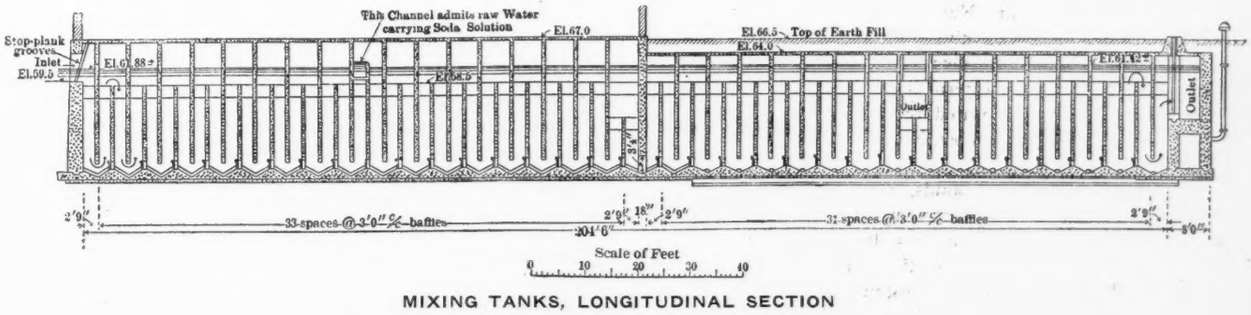
WALL BETWEEN MIXING TANKS

Mixed raw water and lime water from the saturators and raw water chambers enters the mixing tanks at the surface at the southerly end. The first baffle compels it to pass vertically downward and under, it then rises vertically, passing over the second baffle, then down under the third and so on. Another portion of raw water to which the soda solution has been added flows through the channel in the upper part of the dividing wall from which it is deflected laterally into two small channels, over the down stream edges of which it falls into the raw water to which the lime water has already been added. The completed mixture of raw water, lime and soda ash is mixed by still more baffles before reaching the outlet. About one hour is required for the water to pass through the mixing tanks. It is possible, however, to draw it off, if desired, when it has passed either one-half or three-fourths of the way through the tanks. The two tanks can be operated in parallel or in series, the latter having been found frequently desirable.

The saturators, mixing tanks, and all other tanks and similar structures are constructed of concrete, reinforced where necessary, except where otherwise stated.

There are six settling basins operating on the continuous plan and having a total capacity of approximately 15 million gallons, furnishing twelve hours' subsidence under normal conditions. The depth of water in these varies from 19 to 21 feet, the surface being one foot above normal water line on the filters, although water in the basins could be drawn down three feet before the filters would cease operating altogether. The basins are contained between embankments lined with clay puddle 18 inches thick on the bottom and lower slope and 12 inches thick on the upper slope; the 18-inch puddle being protected by a 6-inch concrete lining, and the 12-inch with 10 inches of limestone paving. The lateral dividing and baffle walls are of concrete, as is also the main dividing wall. The last serves not only as a dividing wall, but also to control the flow of water to the several basins and the return to the filters. Softened water from the mixing tanks passes through the softened water channel in this main dividing wall into basins numbers one and two, under deflectors in order to interrupt surface currents, around the baffle walls and back through other openings into the same channel. It then passes through basins three and four and five and six in the same way; after which it passes back through the settled water conduit in the main dividing wall to the filter gallery. It is also possible to admit water to all the basins at once instead of in pairs; in which case settled water is drawn off from each basin into the settled water conduit.

As stated in the general description of operation of the plant, provision is made for adding coagulant through a grid in the settled water conduit. A three-inch lead-lined iron pipe extends practically the full length of the softened water channel, with grids located so that the coagulant can be added just before the water enters the basins, or just after it leaves the last two basins on its way to the filters. The grids are of copper pipe with special composition valves and fittings and are perforated with ¼-inch holes 18 inches from center to center each way. To permit adding raw water to the softened water to eliminate traces of caustic alkalinity, a 24-inch vitrified raw water pipe,



MIXING TANKS, LONGITUDINAL SECTION

connected with the adjustable settling basin weir in the head house, extends through the main dividing wall and has four outlets to the softened water channel, controlled by sluice gates. These admit water to the softened water channel. At each expansion joint in the wall a short length of riveted steel pipe was used in place of vitrified pipe.

The lowest channel in the main dividing wall serves as a blow-off drain for emptying the basins. A 10-inch flushing main is hung from the top of the blow-off conduit from which a branch line with several 2½-inch hose valves extends into each basin.

(To be concluded next week.)

A MASSACHUSETTS WATER DISTRICT

THE city of Boston and the surrounding towns recognized, some years ago, the many advantages of combining for sewerage and for water supply, and the Metropolitan district, embracing some forty communities, was organized for the joint construction and maintenance of systems for these two purposes. There has recently passed the Massachusetts House, and may have become a law before the publication of this, an article incorporating a so-called water district, the object being to enable the villages of Cherry Valley and Rochdale, in the town of Leicester, to construct and operate a joint water supply system.

This act is an enabling one, which becomes void unless accepted by a majority vote of the voters of the district within three years after its passage, during which time not more than three votes may be taken upon the subject. It enables the taxpayers of these two villages to organize themselves as a corporation under the name of the "Cherry Valley and Rochdale Water District," for the purpose of supplying themselves with water for the extinguishing of fires and for domestic, manufacturing and other purposes; with power to establish fountains and hydrants, and to relocate and discontinue the same, and to take or acquire property by purchase or otherwise, and to hold the same for the purposes mentioned in this article; and to prosecute and defend all actions relating to the property and affairs of the district." This corporation is authorized to acquire by purchase or otherwise not to exceed 100,000 gallons per day from Henshaw pond, together with any other springs or water rights adjacent to this pond. The corporation may not charge more than $25 hydrant rental for a maximum term of 30 years, at the end of which the rentals shall cease and the hydrants be for the free use of the town of Leicester, except that it shall pay for extraordinary repairs. This pond is apparently the property of a Leicester Water Supply District previously incorporated, and the Cherry Valley and Rochdale district is to take over all its other corporate property and privileges. In addition it may acquire and construct the necessary reservoirs, pipe lines, buildings, machinery, etc.; the only condition being that it first obtain the advice and approval of the State Board of Health. It may make contracts with individuals, corporations and the town of Leicester for supplying water, and it may extend its mains outside of the limits of the district, and into the adjoining town of Oxford for a distance of 500 feet.

The vote upon the acceptance of the enabling act is to be held at a town meeting presided over by a moderator—an interesting survival of the New England town meeting which probably is found in few other sections of the country at the present time. The town meeting will elect by ballot three Water Commissioners, the term of one of them to expire each year, and to be so constituted that there will always be one resident each of Cherry Valley, Rochdale and Greenville on the commission.

The district may issue bonds, notes or script for not to exceed $125,000, bearing interest at not to exceed 4 per cent, but which may not be sold at less than par value. A sinking fund is provided for, so that the bonds may be retired in annual proportionate payments beginning not more than five years after the date of issue, and all be retired within thirty years. The expenses of the water district over and above the income are to be raised by taxation; also it may, by two-thirds vote of the voters, raise by taxation any sum not exceeding $3,000 in one year for enlarging or extending the water works. These taxes shall be assessed and collected in the same way as ordinary town taxes.

The act provides for protection of the water supply by stating that "whoever wilfully or wantonly corrupts, pollutes or diverts any water taken under this act, or wilfully or wantonly injures any dams, reservoirs, aqueduct, pipe or other property owned or used by said district for the purpose of this act, shall forfeit and pay to said district three times the amount of damages assessed therefore, to be recovered in an action of tort; and upon conviction of either of the above acts shall be punished by a fine not exceeding $100 or by imprisonment for not more than six months."

MARKETS IN BUFFALO AND CHARLESTON

IN response to our request for information concerning the municipal market buildings in Buffalo, N. Y., and Charleston, S. C., we have been furnished by Deputy Building Commissioner Henry Rumrill, Jr., of Buffalo, and by City Engineer J. H. Dingle, of Charleston, with the following particulars.

In Buffalo there are four market buildings—the Elk street market, Washington market, Broadway market, and Clinton market. These were built some time ago, the buildings proper being all of brick construction with wooden roofs; the floors of stone flags and concrete. No ventilation or artificial refrigeration is provided for. Each market has in connection with it open spaces for the wagons of farmers and truck gardeners.

A proposition to erect a new market building to replace the present Washington market has been agitated for some time, and has now been seriously taken up; data being obtained and sketches being prepared at this writing. The proposed building will be about 260 by 460 feet, of fireproof construction. The entire interior will be lined with enameled brick; the floors will be of concrete; the stalls of fireproof construction and of uniform design; the cellars provided with cold storage, with elevators leading to them from the main floor, and there will also be heating, refrigeration and lighting plants; appliances for the receipt and disposal of garbage; waiting rooms, toilets, etc. It is proposed to divide the building so as to separate the wagons from the space reserved for stalls.

The City Architect is also preparing plans for rebuilding a portion of Clinton market, which was recently damaged by fire. The new construction will consist of an open shed 63 by 250 feet, to be utilized as a hay market and also for farmers' wagons. Iron and steel will be used for the construction and the roof will be of slate or asbestos shingle.

Charleston, S. C., has a municipal market consisting of a covered area extending over three or four blocks. The roof, which is mostly of tile, is supported on brick pillars about 30 feet apart across the building, which are connected longitudinally by wide arches. The floor is paved with brick and flagstones. The stalls are located along either side, leaving a passageway through the center of the market about 10 feet wide. The character of the stalls is left mostly to the tenants, who rent the same from the Board of Market Commissioners. The Commissioners employ a clerk who supervises the market and keeps it in a clean and neat condition. There are no special provisions for sanitation, and artificial ventilation is unnecessary as the market is practically in the open air.

In the sections devoted to the sale of meat each butcher has his own refrigerator. The sale of meat was formerly restricted to the market, but recently this restriction has been removed with the result of considerably reducing the use of the market for this purpose. Vegetables are sold mostly by aged negro women, who give a picturesque appearance to the market.

Photographs and some details of this market were given in our issue of April 22, 1908.

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper, either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL AND ENGINEER, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

MAY 4, 1910.

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Filters and Bacillicides

THE article by Rudolph Hering which appeared in last week's issue expresses an opinion which, especially in view of the high standing of the author, is of unusual importance. If his deductions and those of the investigators whom he quotes be correct, a sand filter may permit pathogenic bacteria not only to pass through it, but even to multiply within it under favorable conditions. If the permeation through the filter is in the nature of a growth, or even of a slow transition from particle to particle, then the interval between cleanings becomes a matter to be regulated by something more than loss of head; and the treatment which successfully removes other suspended matter is not adequate for the treatment of living microscopic organisms.

This would seem to be another argument in favor of multiple treatment in place of the single filtration which was considered sufficient a few years ago; and in favor of some treatment which will actually kill the bacteria rather than attempt to strain them out. Two substances used for accomplishing this destruction were discussed at length in our issue of April 20—hypochloride of lime, or "bleach," and ozone. The former is in practical use in scores of cities; the latter seems to be rapidly approaching a stage of practical applicability, both mechanical and financial. And other methods theoretically possible may in time be made practically so. The doubt raised by Mr. Hering's article, therefore, does not find us unprepared to adequately meet the difficulty; but the main problem presented is, under what conditions such supplementary treatment for bacteria destruction is necessary.

Fire Hose Specifications

THE new New York specifications for fire hose, which are printed on another page, are the result of an attempt by Fire Commissioner Waldo to insure that in future better hose be obtained by the department than in the past. These specifications were prepared by the engineers of the National Board of Fire Underwriters and of the Department of Finance, and by the chief engineer and chief chemist of the associated factory mutual insurance companies of New England, representing the New York Merchants' Association, all experts of high standing in fire apparatus. Other specifications had been prepared some months ago, but most manufacturers refused to bid under them, objecting to the requirements that the cotton duck be of the best quality of Sea Island cotton, and that the rubber be of the best quality of pure Para rubber, to constitute at least 65 per cent of the compound. The experts decided these requirements to be unnecessarily stringent, and that a cheaper rubber compound would be even better than pure Para.

The hose will be tested under these specifications by a board composed of several of the higher officials of the Fire Department, which must certify to the conformity thereto of all hose bought.

Exhibits at Conventions

PRESIDENT MASON, in his annual address before the American Water Works Association, stated that he considered the personal acquaintances made and the information obtained by "buttonholing" experts at conventions to be of even more value than the papers. Still another source of benefit at many conventions is the exhibition of appliances and materials from which all, but especially the younger members, may derive invaluable information concerning the practical side of their profession. The Water Works Associations especially seem to find such exhibits desirable. At the convention of the American Water Works Association last week, there was shown the latest ideas in meters, valves, sprinkling cart connections, meter boxes, pipe locators, aquaphones, and various other contrivances, which gave a wider and better knowledge of these than any amount of reading and agents' descriptions could have done.

The exhibit committee of the New England Water Works Association is this year introducing a new feature, space being provided for the display of special tools or devices invented by superintendents or managers of water works plants, also for drawings or photographs of machines, emergency outfits, tools or testing apparatus, plans of shops, supply storehouses, etc. This seems to us an excellent idea, and one calculated to bring to the attention of members good devices which they might otherwise never hear of, because of the idea of their inventors that they are not worth a regular paper, or of the hesitation or difficulty which many well-informed men find in expressing their ideas on paper.

Unauthorized Use of Society's Name

ANENT the International Lecture Institute, referred to last week, the secretary of another of the societies whose name was used by the Institute writes thanking us for making the matter public, and stating that "So far were we from authorizing the use of our name, I did not know there was an International Lecture Institute until I saw its name in this article. I thank you for taking for granted that we had not loaned our name to anyone guilty of such practice."

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

ROADS AND PAVEMENTS

Brighton Instals Crusher Plant

Brighton, N. Y.—The town of Brighton has long been one of the leaders in good road building in northern New York. Nearly twelve years ago it built a macadam road connecting Paul Smith's Hotel with the railroad station at Gabriels and later extended the road to the Hametstown line. Recently a crusher of 500 cubic yards capacity has been installed at a granite ledge about a mile west of Paul Smith's Hotel. The crusher is operated by a 50-horsepower electric motor, power being obtained from the Paul Smith's Light and Power Company. Rock drills in the quarry are operated by electricity.

Paving Report

Burlington, Ia.—The reports for the fiscal year ending March 31 are being filed with City Clerk Robert Kroppach. An interesting one is that of City Engineer John F. Winters. This gives the total paving of Burlington to be 34.20 miles in extent, a gain of 3.4 during the past year. The report is as follows:

Brick pavement	21.25 miles
Tarviated	.65 miles
Macadam	10.55 miles
Lime stone block	1.38 miles
Granite block	.11 miles
Mineral rubber asphaltic concrete	.25 miles

The city has made great progress in the direction of getting out of the mud in recent years. The engineers reported the following total mileage in their annual reports:

1906	25.45 miles
1907	27.34 miles
1908	27.73 miles
1909	29.83 miles
1910	34.19 miles

Chicago Plans to Make Its Asphalt

Chicago, Ill.—Arrangements for the city to do its own street repairing next summer have proceeded so far that announcement was made of the construction of a portable asphalt plant by the Link Belt Company, West Thirty-ninth street and Stewart avenue, with the tacit understanding that it will be purchased by the city. The plant will cost nearly $10,000, and an order for its purchase will be ready for introduction at the next Council meeting, May 2. Only one type of plant will be considered, a plan which will obviate the customary delay of advertising for bids. Sixty days are allowed for construction and an early start before a contract had been signed is made that it may be available when needed.

Louisville Street Report

Louisville, Ky.—A report from the City Engineer's Department shows that the city has 288.9 miles of paved and unpaved streets; that 91.3 miles is now unpaved, and that 197.6 is paved. The report shows the following:

	Miles.
Macadam pavement	66.9
Vitrified block pavement	57.5
Asphalt pavement	39.5
Granite block pavement	19.2
Bowlder pavement	7.1
Turnpike roads (macadam)	3.8
Cold asphalt pavement	2.0
Gravel pavement	.9
Wood block pavement	.3.

Eliminate Surety Bonds

Milwaukee, Wis.—The Board of Public Works has decided to eliminate bonds of surety companies for sidewalk contractors and to make personal bonds sufficient guaranty for faithful performance of work. This action was taken as a result of the reported decision of surety companies to increase rates $15.

Market Street Wood Block Is Sticky

Philadelphia, Pa.—When the wood block pavement was put down in Market street the blocks were treated to an extra dose of creosote and other ingredients that are now being boiled out into a black, sticky mass, that transforms the street into a coal black highway. Director Stearns, discussing the unusual conditions, said that the extra quantity of creosote was put into the blocks to insure the life of the pavement and minimize the cost of repair. The specifications called for blocks treated with creosote, 20 pounds to the cubic foot. It is said that the blocks were actually treated with a quantity equal to 24 pounds. Director Stearns expresses the belief that after this summer there will be no repetition of the unpleasant conditions now being experienced with the blocks. Chief W. R. Benson, of the Highway Bureau, says that no complaints have been received of the present condition of the paving, but, on the other hand, the automobile owners say the tar coating prevents skidding, and they like it.

Investigate Dust-Laying Methods

Portland, Me.—Commissioner of Public Works Bion Bradbury, Jr., Superintendent of Streets Charles E. Clifford and Engineer William L. Thompson, of the Park Department, have returned from Boston, where they inspected dust-laying compositions and stone crushing plants. They had three busy days, saw asphaltoline, tarvia, crude oil, asphalt oil, coal tar, oil emulsions, genasco and other compounds for macadam road binders and dust destroyers. Treatment of macadam, asphalt, gravel and dirt roads with these fluids was witnessed and the results noted carefully. They will discuss the matter with Mayor Charles A. Strout in an endeavor to select a preparation that will remedy road evils in this city.

All Vehicles Taxed for Road Repair Fund

Richmond, Ind.—A vehicle license ordinance has been passed with the provision that the proceeds be used for the repair and maintenance of streets. It places a tax on every kind of vehicle, from automobiles to bicycles. The amount of the license charged for the principal classes of vehicles is as follows: Two-horse trucks, $5; one-horse trucks, $3; sprinkling wagons, $5; express wagons, $2; milk wagons, one horse, $1.50; two-horse, $2; one-horse dray, $2; two-horse dray, $3; buggies, $1.50; automobiles with seats for three or less, $10; automobiles with seats for four or more, $15; motorcycles, $2.

Ordinance Regulates Street Opening

South Bend, Ind.—An ordinance regulating the opening, excavating and cutting into streets and alleys in South Bend has gone into effect. Violations of any section or any of the provisions of any section are punishable by a fine not to exceed $500. Permits to open a street or alley are issued by the City Engineer, who charges 25 cents for each permit. The ordinance requires that a petition be filed with the Engineer before any permit is issued, which shall definitely state the location of the proposed opening and its purpose. The petition shall be accompanied by a bond payable to the city in a sum ranging from $100 to $5,000, as the Engineer may designate, which bond shall be conditioned for the saving of the city harmless from loss, cost or damage by reason of the proposed work, and that it be done in all respects in conformity with the ordinance and other city measures.

Upholds City in Street Paving Case

Marengo, Ill.—A decision of the State Supreme Court in the West Washington street paving controversy at Marengo upholds the right of the City Council and Board of Local Improvements to pave a street despite the protests of the residents providing the special assessments are fair and there is nothing illegal about the awarding of the contract, etc. It is probable that work which was halted last fall will be renewed on the pavement at once. John Fair of Belvidere is the contractor.

New Viaduct in Sioux City

Sioux City, Ia.—The new viaduct spanning practically all of the railroad tracks entering the city, and costing $200,000, has been opened to traffic. The total length of the viaduct

Courtesy Sioux City Tribune

NEW VIADUCT OVER RAILROAD TRACKS, SIOUX CITY

and approaches will be about 1,680 feet. The main structure is paved with creosoted blocks, the north approach with brick blocks and the south approach with sandstone.

An Odd Paving Item

Paterson, N. J.—The budget of Passaic County for 1910 contains an item of $7,177.95, appropriated "for roads suddenly destroyed."

SEWERAGE AND SANITATION

To Halt Spitting in Camden

Camden, N. J.—An anti-spitting ordinance has been passed by the Board of Health, making it unlawful to spit on the sidewalks or in public halls or conveyances. The penalty is $5 fine or thirty days in jail.

Dust-Proof Wrappers for Bread and Cake

Indianapolis, Ind.—Following the notice given to the bakers by the State Board of Health and State Food Inspector Barnard that the law requiring that all bread must be put in bags, circular letters have been mailed to every baker in the State giving instructions as to how the bread is to be covered. The letter follows:

The Pure Food Law of 1907 and the Sanitary Food Law of 1909 define unsanitary conditions as they may exist in food producing and distributing establishments, and provide that all food in the process of manufacture, sale and distribution be securely protected from flies, dust and dirt.

Bread, pastries and other bakers' goods which are not delivered to the consumer at the bakeshop but which are carried unwrapped to the grocery stores and other distributing stations in wagons, carts or similar conveyances, are not properly protected and the practice is in violation of the law.

In order that the sale of bread, pastries and other baker's goods may be conducted under sanitary conditions and in conformity with the laws of the State, bakers are hereby instructed that on and after July 1, 1910, all such goods, including bread, buns, rolls, biscuits, cakes, crackers, doughnuts, pies and other baker's products must be properly protected while in transit or while displayed for sale.

For the guidance of bakers, it is ordered that bread shall be wrapped in suitable paper wrappers, or placed in suitable bags before being taken from the bakeshop, and that other goods shall be carried in tight, dustproof boxes or cartons.

This order shall not apply to baker's goods which are sold directly to the consumer at the bakeshop where they are made.

County, City and Town Health Officers, State Food Inspectors, and all other officers, whose duty it is to enforce the Pure Food and Sanitary Food Laws, will be governed by this notice in regulating the operation of bakeshops and the sale of bread and baker's products.

H. E. BARNARD,
State Food and Drug Commissioner.

Legislative Committee Inspects Route of Proposed Sewer

New Bedford, Mass.—The situation in New Bedford as regards the problem of caring for the city's sewage was brought closely to the attention of the members of the Legislative Committee on Cities who visited the city for the especial purpose of getting information in connection with the city's petition for the right to expend upward of $2,000,000 in providing an intercepting sewer system. This proposition has been long in abeyance, and the prediction has been made in years back that the city must some day come to adopt such a system for obviating the present sewer nuisance. This proposition comes up at this time through the urgent necessity of doing something immediately to obviate the sewage nuisance in the cove. After listening to the city officials in the committee room in the State House, the committee on cities decided to come down and see for themselves, and the visit was the result. In four automobiles, in company with Mayor Ashley and City Engineer Williams, the route of the proposed sewer was followed and the present condition in the cove inspected.

WATER SUPPLY

Consumers Having Meters Enjoying Minimum Rate

Haverhill, Mass.—The report of Water Register Albert L. Sawyer for 1909 says regarding meters:

There were 162 new services put in during the year, and 133 meters were set, the total number in use being 974. Practically everything in the line of manufacturing is now metered, together with those water takers for whom it would be difficult to fix an equitable rate. Our report shows that 15 per cent of the services are metered. In making the extension of pipe in the western part of the city, the new services, being on the high service, were all metered. In view of the large consumption of water, it might be of advantage to consider the advisability of a more uniform extension of the meter system along similar lines. Our records show that a large proportion of those having meters do not use their allowance, while it has been found, I think, that by keeping the fixtures in repair all the water needed can be used and still keep very close to the minimum rate of $10. Of the 657 meters used in private houses, 127 showed a consumption greater than the allowance, the excess ranging from 40 cents to $29, but 90 of the 127 excess bills were for amounts less than $6.

Private Water Plant for County Building

Elizabeth, N. J.—A water works has been installed in the Court House which will save the county about $100 a month. An 8-inch well was sunk 200 feet, when a good supply of water was found. A tank holding 1,300 gallons has been built on the roof. The pump is motor-driven and automatically controlled, so that it keeps the tank full. The cost of running the plant is about $50 a year.

Citizens Fight High Water Rate

Media, Pa.—Joseph Lindsay and other citizens have begun suit in equity against the Springfield Consolidated Water Company, asking the court to enjoin the company from maintaining the new water rates with a minimum charge of $18 a year for one faucet. The new rates, the petitioners declare, are exorbitant and excessive, and remedy is sought at law. The court is further asked to decree that the charges for water be decreased, as the court may see fit; to forbid or decrease the fixing of the minimum rate at $18 a year; to make a decree of discovery to learn the costs of supply of water, the number of consumers, the gross revenue for the company, the net revenue and other matters, and to discover the revenue from all sources, particularly from Clifton Heights. The preliminary injunction is asked to enjoin the company from enforcing the payment of the high minimum rate. It is stated that the charges are higher than those of other companies in the Commonwealth.

No Tax Levy for Water Works Funds

Pratt, Kan.—Water rates have been recently raised because a new law recently passed by the Legislature requires cities of the second class owing water plants to place them on a basis where they will be self supporting. The city is not allowed to make a tax levy for water works funds, as hitherto, but must pay running expenses, interestin on outstanding bonds and take up the bonds when they become due from the rents collected from water consumers.

Beautifying Water Works Grounds

Washington, D. C.—Captain Hannum, the new Engineer Officer in charge of the District water supply system, has entered actively into the scheme of beautifying the public places in the District of Columbia. He is utilizing all the funds at his disposal, available for that purpose, in adding to the attractiveness of various parts of the aqueduct system. Particular attention is being devoted to the improvement of McMillan Park, which includes the filtration plant, the big reservoir and auxiliaries, located on the high ground just south of the Soldiers' Home grounds between First and Fourth and Fifth streets. Trees and shrubbery have been planted and lawns made wherever possible. Terraces are being laid out on the bluff just north of Bryant street. Rose bushes are being planted on the southern slope of the reservoir just east of Howard University. When the plans are developed McMillan Park will be one of the beauty spots of the District. Even under present conditions it compares favorably with many of the other parks. Other attractive features of the aqueduct system are the fine gardens established with great care and attention, at the distributing reservoir about one and one-half miles above Georgetown, and at the receiving or Dalecarlia reservoir at the District line, about two miles farther west.

STREET LIGHTING AND POWER

Will Apply for Reduction in Price of Gas

Augusta, Ga.—Chairman Austin Branch, of the special committee appointed by Mayor Thomas Barrett for the purpose of investigating the quality and price of gas furnished in Augusta, has completed his report and submitted the same to the other members of the committee. His conclusions are that gas can be manufactured in Augusta for $1 a thousand, with a fair return on the actual value of investments. That $925,000 in securities have been issued on the local plant, which is not worth over $350,000. That the increase in price from $1 to $1.20, made in 1909, was unfair. The remedy suggested is a complaint to the State Railroad Commission, which is authorized to fix rates.

City Electric Lighting Plant Pays

Hagerstown, Md. The annual report of Hagerstown's municipal electric plant, established ten years ago in the face of great opposition, has been submitted by Light Superintendent J. Oscar Beard to the Street Commissioners. The earnings of the plant over expenses amounted to $14,330, estimating the cost of each of the 163 arc lights at $50 a year. The operating expenses were $29,689 for the year. The sum of $4,862 was allowed for depreciation of the property, being fixed at 6 per cent. The coal bill was $10,652 and the labor bill, $7,181. The total earnings of the plant were $44,020. Of this sum $35,645 was received for current supplied private citizens for light and power. During the year $26,561 was expended for betterments, a new turbine outfit having been installed at a cost of $23,000. The original cost of the plant was $63,323. Since it was built the added improvements have cost $75,038, but the sum of $35,629 has been deducted for depreciation. The present value of the plant, less depreciation, is $102,722. Cash on hand amounts to $3,131. All bills, excepting $2,000 on the turbine outfit, have been paid and a large supply of coal is on hand. Mr. Beard estimates the revenue for the coming year at $35,000 and the expenditures at $30,000. He says no levy will be required for the plant, nor for electric light bonds and bond interest. During the year a $1,000 electric light bond was redeemed and $2,180 paid out for bond interest. Officials from many cities are constantly visiting Hagerstown to inspect the operation of this successful municipal light plant.

New Company Would Cut Lighting Prices Fifty Per Cent

Haverhill, Mass.—Alderman John T. Desmond has had presented to him a proposition whereby an out-of-town concern is willing to furnish the city all its street lighting service for about one-half the present cost, and although he is not yet ready to divulge the name of the firm nor the complete plans, he says that within a short time a written offer will be presented to the Municipal Council for consideration. The city would be unable to accept the terms of any concern at any price, no matter how low, for two and one-half years, as the present contract with the Haverhill Electric Company does not expire until 1912. The city is paying $100 for every arc light, and it is understood that the proposition which Alderman Desmond has had submitted to him would cut that price in half. The offer, when it is finally presented for consideration, may have some bearing on the municipal ownership problem, as it is figured that it is far better than anything that the Electric Company has offered to date, and is below the cost of what it is believed the city could manufacture and furnish its own street lighting for.

Electric Light Plant and Water Works Profitable

Lewes, Del.—The Board of Public Works has conducted the municipal electric lighting plant and the water works for the year with all expenses paid and a balance of $3,100 on hand, a conclusive argument of the value of a town owning its own light and water works. During the year many improvements have been made to the two plants and lower rates given the consumers than any plants in the State, according to a report made at the regular meeting of the Board. Mayor James T. Thompson was re-elected president of the Board, and Miss Annie Nichols treasurer and secretary. The power house is expected to make a record for the coming year, and the town expects to get a big profit from the two plants.

Regulating Electric Signs

Dallas, Tex.—Commissioner William Doran has recommended that section 35, paragraphs H and I, electrical ordinance, relating to signs, be amended as follows:

All signs must have illumination of at least six candle power per square foot; all lamps must be on exterior of sign.

No sign shall be hereafter placed over or along any street, alley, sidewalk or public place that shall extend more than six inches from the private property line unless such sign shall be illuminated to the extent of not less than six candle power per square foot. Such illumination on every such sign shall be from dusk until 10 p. m. of each day, not including Sundays. All signs not constructed or maintained in accordance with the provisions hereof shall be disconnected and removed within ten days after the person maintaining the same shall be notified by the city electrician.

In the present ordinance eight candlepower is provided per square foot and illumination is required from dusk until midnight.

Electrical Display Signs in Favor

Schenectady, N. Y.—There is a concerted movement afoot to petition the Common Council for an amendment to the ordinance relating to the placing of electric signs upon buildings, so as to make the space in which the signs can project from the buildings ten feet instead of three, as at present. The present law also states very clearly that they shall not hang lower than eight feet above the sidewalks. It is also proposed to make this limitation ten feet instead of eight. A number of Aldermen have been approached on the subject, as well as Mayor C. C. Duryee, and it is thought from the expressions that the Council will not hesitate to make the amendment as petitioned or that the Mayor will sign it after it is passed.

City in Darkness

Duluth, Minn.—Duluth was left without electric light or power for several hours Saturday, April 16, by the burning out of the duplicate transmission lines of the Great Northern Power Company, one mile east of Proctor. Hundreds of people were left marooned on the street cars, in practically all of the stores of the city, on the streets, or wherever they happened to be. For hours they were compelled to sit or stand around to make the most of the unfortunate circumstance. The street cars did not turn a wheel from 10 o'clock Saturday night until about 4 o'clock Sunday morning, while the streets and sidewalks were covered with two inches of slush. Almost the entire city was in darkness for the same length of time. A small part of the downtown section got light and power shortly after 1:30 o'clock Sunday morning, but the general service in the city was not resumed until about two and one-half hours later.

Substituting Magnetite for Open Arc Lights

Elgin, Ill.—With the installation of the twenty-five new arc lamps, the locations of which have just been established by the various Aldermen, the city will have 427 arc lamps in operation. At a conference between Manager E. C. Faber, of the Aurora, Elgin & Chicago Railroad Company, and the lighting committee of the City Council, the magnetite type of arcs was decided upon. The street lighting proposition was taken up with Mr. Faber and with E. F. Gould, electrical engineer for the same company. Alderman Aldreseen, chairman of the committee, requested the company officials to take under consideration the proposition of removing all of the old-style open arc lamps and replacing them with the new style of magnetite arc. This matter is now being considered by the A. E. and C. Company as is also the proposition of installing fifty new magnetite arcs instead of twenty-five. At the present time there are 216 open arcs in the city. The magnetite arc is being operated in the Fifth Ward and is found to work most successfully. There is less danger of its going out in case of high wind, also from any of the various reasons that the old-style open arc does. The advisability of removing all of the electric light towers of the city was also discussed at this meeting, and is said to have met with favor upon the part of Mr. Faber. The company's employees have to climb these towers daily to trim the lamps and they say this is dangerous, not only in good weather, but that the condition of the towers have become such that in stormy, windy weather the trimmer takes desperate chances.

FIRE AND POLICE

Fire Makes Bridge Unsafe

Boston, Mass.—Crossed electric wires caused a loss of $200,000 last week in the most extraordinary fire Boston has experienced in some time. As a result of the burning of the new Charlestown bridge, navigation of the Charles River is closed, elevated trains are tied up for an indefinite time and vehicles of every description will not be permitted to cross the bridge under any consideration until the architects and engineers pronounce the structure safe. A fire was caused by crossed electric wires in the draw turret. A brisk blaze started, and this was followed almost immediately by the explosion of two compressed air tanks carrying a pressure of 2,000 pounds to the square inch. The force of the explosion scattered a great quantity of a highly inflammable oil over the woodwork at the base of the bridge and within a few minutes a tremendously hot fire was raging. The heat of the fire took the temper out of the steel girders of the bridge, rendering the structure unsafe, and at the same time the machinery which operates the draw was completely destroyed, leaving the bridge as an impassable barrier to navigation.

Fireboats Helpless as Council Holds Up Bills

Buffalo, N. Y.—The Buffalo Drydock Company has refused to receive the fireboats "Potter" and "Hutchinson" unless the Fire Commissioners will give their personal guaranty that the bill will be paid. The company's reason for refusing to repair the two boats without a bond is that the city has not yet paid for the repair of the fireboat "George R. Potter" last November, the bill amounting to $1,131.62. The Aldermen approved the bill, but the Councilmen objected because the work had not been advertised, although it cost more than $500. The Corporation Counsel advised that the Fire Commissioners could not know in advance the extent of the work required, and the materials having been furnished and the labor performed in good faith, the company could recover at law the amount of the claim. But still the bill remains unpaid, and the boats, which were damaged by breaking ice all winter to keep the harbor open, are liable to a breakdown at any time. In addition to affording protection to millions of dollars' worth of property along the water front, the three fireboats also feed the high-pressure pipe lines in Washington and Pearl streets.

Protect Hose with Bridges

Evansville, Ind.—The street railway company has notified the Board of Safety that it would purchase hose bridges to place across street car rails during a fire when lines of hose cross a track.

To Investigate Fire Department

Indianapolis, Ind.—Within a short time the Board of Public Safety expects to make an investigation of the Fire Department with a view to making a number of changes in the force. A number of men, who are said to be physically unfit for service may be retired on pension, it is said. In connection with the proposed changes, it is said some changes may be made in the Assistant Fire Chiefs, although it has not been stated whether this will be by reduction to the ranks or by retirement on pension. In going through the department, men who are believed to be too old or otherwise physically incapable of the duties of a city fireman will be sent to the Police Surgeon for examination. If the Police Surgeon states they are unfit for service they will be pensioned.

No More Fire Horses for Them

Kansas City, Kan.—No more horse-drawn fire fighting apparatus will be bought for Kansas City, Kan.. The City Commissioners have decided that in the future they will buy only the most improved motor trucks, fire engines and hose wagons. As a result of the new policy W. A. Harris, an architect who has prepared plans for the new fire station to be built at Fourteenth street and Reynolds avenue, was instructed to draw a new set of plans for a building suitable for the accommodation of motor instead of horse-drawn apparatus.

Will Protect Firemen During All the Fires

Knoxville, Tenn.—Hereafter at all big fires in Knoxville a space sufficiently large enough to allow the firemen room to work and protect the crowds will be roped off and guarded by policemen. Two rolls of rope, each one hundred feet in length, were this morning placed on the chemical engine company of the Commerce avenue fire station, which answers all alarms in the business district of the city.

New Police and Fire Alarm System Devised

Macon, Ga.—Within the next two months the city of Macon will install what is claimed to be one of the finest and most perfect police and fire telephone, alarm and return call system to be found anywhere in the United States. The system is the invention of City Electrician Charles Humphries. The model of the combination call box and pedestal arrived last week and is on exhibition at the City Hall, where it was operated to the complete satisfaction of Mr. Humphries and the city officials. The post is an iron stand, nobby in appearance and design. On one side is a police alarm box, similar in appearance to the present fire alarm boxes, and on the other side is one of the latter. The police box permits of a call for the patrol wagon by merely inserting and turning a key, there being keyholes on either side. The box opens to a telephone, which will connect with the private exchange at the city auditorium, where telephone "girls" or a central will be on duty every minute of the day and night. Every member of the city administration will be supplied with a key opening the telephone feature of the box, and it will thus be easy for communication with any part of the city to be obtained. A policeman may call up the station and explain, or notify a man that his store door is opened. The Fire Department men can talk to each other from the scene of a fire and city employees and officials will have the privilege of the telephone system. These boxes will be distributed throughout the city and even in the annexed suburbs, the arrangement will be complete. All of the boxes will be operated by an underground system of wires, a large part of which has already been laid. These wires all lead to the City Hall, on the second floor of which one of the best equipped exchanges in the country has already been installed. The large switchboard will arrive from Chicago this week. A unique, and at the same time a very useful, feature of the police alarm box is the "howler." This is located in a round cap on the top of the post, and is operated from the central exchange. It makes a peculiar sound, a "howl" like that produced by putting a telephone mouth piece to the receiver of the instrument, only more piercing. It will be used in calling the officer to his beat. The city has contracted with Mr. Humphries for this system, which is agreed to surpass in excellence any similar arrangement ever devised.

Rubber Higher, Hose Worse

New York, N. Y.—The National Board of Fire Underwriters, on the recommendation of the National Fire Protection Association, has promulgated specifications for the care of hose for fire uses. The increase in the cost of rubber recently has resulted, it is said, in lowering the quality of public fire department hose. Practically the entire hose industry of the United States, comprising 31 companies, has gone on record as opposed to bidding for specification hose. Tests of new hose samples show, it is said, that the quality is sub-standard, owing to the cost of rubber. As a result the fire insurance companies are asking bureaus and inspection offices furnishing reports of the efficiency of fire departments to include statements as to the quality of hose found in service, based upon the list made at the underwriters' laboratories at Chicago.

Oroville to Have Chinese Firemen

Oroville, Cal.—Oroville's first paid Fire Department is to be composed of Chinese and it will be organized at once. A call has been issued for a meeting of merchants and property owners of Chinatown, at which the details of organization of a paid department are finally to be arranged. The plan calls for the employment of eight men with shifts so arranged that the men will be on duty at all times to respond to fire alarms. The company will recognize Fire Chief Mitchell of the city's volunteer Fire Department as their chief.

Tapper System for Portsmouth Fire Department

Portsmouth, Va.—Superintendent Smith, of the fire alarm telegraph system, has commenced the installation of a tapper auxiliary system as an adjunct and a very desirable addition to the local Fire Department's equipment. The system will enable all fire engine and truck houses in the city to notify all stations when they are out on "still" alarms. It will be connected with all stations, and in the event of an alarm from any district it will be possible for the responding company to notify all other stations of the response by merely pulling a lever. This will ring in a tapper alarm to all stations, tapping the number of the company which has responded. When the company has returned the tapper system will again be called into service in notifying the stations of the return of the company that has been working on a "still" alarm. The completion of the new system will do away with the necessity of notifying the engine houses by telephone, a method that requires the loss of much valuable time. Superintendent Smith will also install a new 110-cell battery, which will supplant one which has been in use for the last six years.

Police Increase Veto Overruled

Somerville, Mass.—In vetoing an item in the annual department appropriations increasing the pay of all the police force below the Chief, Mayor Woods said:

No class of persons in the public service are so well paid as the police. They have two weeks' vacation with pay; one day off each month with pay; receive pay four weeks if disabled in the performance of duty, and in case of disability that renders them permanently unable to do duty, are retired on half-pay for the rest of their lives, which half-pay is more than the average laboring man earns.

If any money can be found to spare, I believe the most imperative need is to use it to make a substantial beginning in industrial education.

The item was promptly readopted by the board without a word of debate by a unanimous vote, an action unprecedented in the memory of the oldest citizens.

GOVERNMENT AND FINANCE

Want Budget Made Clear

Cincinnati, O.—Cincinnati should have a budget that everybody can understand, says the Bureau of Municipal Research, in a brief preliminary report submitted to Mayor Schwab. The principal suggestions made by the Bureau of Research includes a method whereby the Mayor may become better informed as to the exact needs of each department, and for this purpose it is recommended that printed forms be sent to the heads of departments which, when filled out, will contain detailed information as to how much the department wants and what they intend to do with it in detail. When the Mayor has received these forms with the full information they should be placed at the disposal of the general public, and for this purpose he is to arrange for public hearings upon the estimates before formulating his budget. Departmental heads would be called into these meetings to make the necessary explanations. At these hearings the citizens or civic bodies might make such requests and recommendations as they saw fit.

Congestion Problem Before New York Legislature

New York, N. Y.—Problems of population congestion in cities have been taken by the introduction in the Legislature at Albany of two bills, which the Committee on Congestion of Population in New York hopes will be passed this session. The first measure, of which Senator Brackett is sponsor in the upper house, and Assemblyman Miller of Nassau County, in the lower house, calls for the appointment of a commission of sixteen to go into the question of how best to persuade families to move into the country, where they could become more prosperous. The second bill gives the Board of Aldermen in cities of the first, second and third classes the power to prescribe the amount of building that may be done in any district; how much lot space may be taken and the height of buildings. This is to secure light and air for all districts.

Board of Public Works Created

De Pere, Wis.—An ordinance has been adopted by the Common Council to create a Board of Public Works.

Reforms in Milwaukee

Milwaukee, Wis.—The new Socialist city administration, under Mayor Emil Seidel, has already started the following reforms:

Forcing the electric railway system to use the tracks of the Chicago and Milwaukee Interurban line across a downtown viaduct to shorten the time of service between the south side of the city and the rest of the town.

The establishment of a corps of city plumbers to force down the prices charged by contractors. When leaks in city water pipes are reported this city plumbing office will do the work, and charge it at cost price against the taxes on the property where repairs are made. An ordinance is being drawn to make this change.

A war upon slums is started.

A single expert is being sought to take the place of the present three-man Board of Public Works. An outside municipal engineer will be selected probably to take the place as well of the present City Engineer, whose salary is $4,000, as the three commissioners, whose salaries are $2,500 each.

An outside expert is being looked for to take the office of Health Commissioner.

The city's free Law Department is being put in shape to give free advice to the poor. The City Attorney is already being called upon for such advice, but has not been able to get the new bureau in working order as yet.

Summons for Violators of the City Ordinances

New York, N. Y.—Corporation Counsel Watson has been requested by the Board of Aldermen to draft a new ordinance which will save automobilists, business firms, truck and wagon drivers, in fact, anybody who violates a city ordinance, from a great deal of annoyance. Under the present system, if an automobilist is charged with overspeeding, or if a driver violates the rules of the road, he is arrested and taken to a police station, where he is held until bail is furnished for his release. Alderman John J. White has conceived the idea that the practice of arresting people for these infractions of the city ordinances can be eliminated and a summons system instituted. His plan calls upon the Police Commissioner to furnish each policeman with a pad of blank summonses. This pad the policeman must have on his person when he goes out on a tour of duty. When he observes a person violating a city ordinance, instead of arresting him, under the White plan he must give the offender a summons to appear in the police court the next morning. Alderman White also provides in his plan that if the person upon whom the summons is served fails to respond in court then he is to be arrested on a warrant.

Mayor Discharges Every City Officer

Hillsboro, Ill.—Mayor B. Truitt has carried out his threat following an election and discharged every appointive officer of the town, because the voters of Hillsboro failed by four votes to endorse the $5,000 bond issue to pay off the city's indebtedness. Mayor Truitt holds that the city cannot operate without the bond issue and a special election to provide for the issue of bonds may have to be held unless the present officials are willing to serve without pay. The officials discharged are members of the police force, night and day; five members of the board of health, superintendent of streets and assistants and the city water works employees.

Des Moines Charter for Tonawanda, N. Y.

Tonawanda, N. Y.—At a public hearing before the Mayor and Comon Council so much hostility was shown to the proposed amendments to the Tonawanda charter that it was voted to ask Assemblyman MacGregor to withdraw the bill before the Legislature. It was decided to draw up a Des Moines charter and present it to the Legislature next winter.

Will Inspect Accounting Methods

Washington, D. C.—Alonzo Tweedale, Auditor of the District of Columbia, has left the city to visit eight Western cities where improved methods of accounting have been applied to tax collection and levies. He expects to visit Cincinnati, St. Louis, Chicago, Milwaukee, Detroit, Toledo, Cleveland and Pittsburg. These cities have biennial or triennial assessments. It is expected that after examining the methods in use Mr. Tweedale will be ready to recommend some change in the methods of keeping the ledgers in the Assessors' office of the District.

STREET CLEANING AND REFUSE DISPOSAL

Better System of Garbage Collection and Disposal Wanted

Boston, Mass.—Mayor Fitzgerald's public hearing on the collection and disposal of garbage was crowded with men and women who favored better methods. There were many speakers, all of whom showed practical knowledge or study of the problem. Municipal collection was favored as likely to result in the employment of more careful men than those working for contractors. About two-thirds of the speakers favored incineration, rather than reduction, as being more sanitary and less apt to create nuisances.

Garbage Question Narrows Property Rights

Los Angeles, Cal.—The city garbage fight in Judge Hutton's court, where P. J. Durbin is attempting to preserve his right to collect kitchen refuse from hotels and cafés as against Charles Alexander, who holds the exclusive right from the Board of Public Works to collect all garbage within certain districts, has narrowed down to a question as to what it is that Durbin collects from his list of restaurants and kitchens. Durbin claims the material he collects is a by-product of the restaurant business, a merchantable product in which he has property rights. The city asserts it is simply garbage, kitchen refuse within the meaning of the new garbage ordinance, and material over which the city, by virtue of its police powers, has jurisdiction by reason of the fact that it is, or may become, a menace to health.

To Improve Garbage Work

New York, N. Y.—William H. Edwards, Commissioner of Street Cleaning, appeared before the Finance Committee of the Board of Aldermen last week, in support of a measure granting him $15,000 special revenue bonds for the purpose of experimenting with various types of automobile and horse-drawn trucks, by the use of which he hopes to do away with the dust nuisance and the exposure of noisome garbage en route to the dumps. One of his plans is to carry cans of rubbish and garbage away from houses in the cans themselves, leaving empty cans in their stead.

Why Salt Water Is Not Used for Sprinkling

Oakland, Cal.—I. H. Davidson, Director of the Merchants' Exchange, declares that the People's Water Company was responsible for the influence which keeps the City Street Department from using the recently installed salt water fire system in street sprinkling. The Directors have under discussion the salt water system, and the insurance rates, and there is much complaint upon the grounds that, in spite of a number of promises from the local insurance men, there had been no decided reduction. The directors had before them a report from Fire Chief Ball, who stated that the plant had been operative since the second of this month. It was the opinion of the directors that the plant should be used for street sprinkling, and estimates submitted showed that a great saving would thereby result to the city.

Sample Garbage Can for Omaha

Omaha, Neb.—Health Commissioner Connell is having set up at the City Hall a sample garbage and ash container for the examination of owners and agents of buildings, who are compelled by law to provide garbage cans and ash pits for the use of their tenants. The sample container is made of concrete in sections, so that it can be put together anywhere. It is simply a big concrete barrel with a cover. While the law making owners and agents responsible for the furnishing of such conveniences has been on the book of ordinances for three or four years it has never been complied with. Commissioner Connell has recently sent out notices that the ordinance is to be strictly enforced hereafter. "We don't know what kind of a contrivance you want us to install," was the excuse of many men who got the Commissioner's letters. Dr. Connell has supplied a sample. "People don't have to buy this kind of container if they don't want to," said Dr. Connell. "Anything that will comply with the law will suit us, but these real estate men who are agents and other men who are owners must supply something wherein their tenants can place the garbage, ashes and other refuse that accumulates about a house."

Prizes at Public Works Parade

New Orleans, La.—The quarterly inspection of the Department of Public Works took place at Elk's Place, following a parade in the principal streets in which the carts and other modern apparatus were exhibited. Commissioner George Smith and General Superintendent Joseph A. Gleason led the parade in a buggy. All of the street cleaning apparatus was seen, including the new squeegees, pick-ups, flushers, sprinklers, brooms, dump-carts, egg wagons,

Courtesy New Orleans Picayune.

PRIZE HORSES AND CARTS OF NEW ORLEANS STREET CLEANING DEPARTMENT

floats, etc. Quite a number of improvements have been made and the citizens who witnessed the parade saw that the city is getting its street department in good shape. The judges were Councilmen P. J. Greenan, James B. Humphreys and John T. Eastwood, of the Sewerage and Water Department. The prizes were allotted as follows: First prize, saddle, donated by Rasch Brothers, to cart 89, Mrs. Wilkinson, of the Eighth Ward. Second prize, hames, donated by Whitney-Sloo Company, to cart No. 119, Mrs. Kanella, of the Eleventh Ward. Third prize, $5 gold piece, given by Commissioner Smith, to cart 148, owner by Mrs. Dell, of the Seventeenth Ward.

To Prevent Dumping of Refuse in Lake Michigan

Chicago, Ill.—The Mann bill, prohibiting the dumping of refuse into Lake Michigan within eight miles of the shore in front of Cook County, Ill., and Lake County, Ind., declared to be the most important bill affecting Chicago in Congress, was ordered favorably reported to the House by the Interstate Commerce Committee.

Work of New Street Sprinkling Department

Lynn, Mass.—Street sprinkling is one of the biggest problems that the Board of Public Works has to solve this year, and Superintendent of Street Albert C. Doak is doing his utmost to arrange the affairs of this newly created municipal department so as to keep all of the streets properly wet down. The Board is trying to close a deal with the American Car Sprinkler Company, of Worcester, for another sprinkling car. An effort is going to be made this year, also, to obtain better results from the amount of water used in the street sprinkling. Superintendent Doak has given orders that water must not be dumped on the pavements as to form mud puddles, and his instructions up to date, he says, have been complied with. He has directed the street sprinkling car crews to be careful not to splash pedestrians or vehicles with water, and not to monopolize the entire streets through which the cars happen to be passing.

Police Force Commended for Keeping Streets Clean

Washington, D. C.—Maj. Richard Sylvester has issued a circular to the members of the police force, commending them for their efforts in the matter of keeping the streets clean, and says he hopes they will continue their good work. Credit for the condition of the streets is also given by the Superintendent of Police to employees of the Health and Street Cleaning Departments, park policemen also receiving praise.

RAPID TRANSIT

Suburban Cars Not for City Passengers

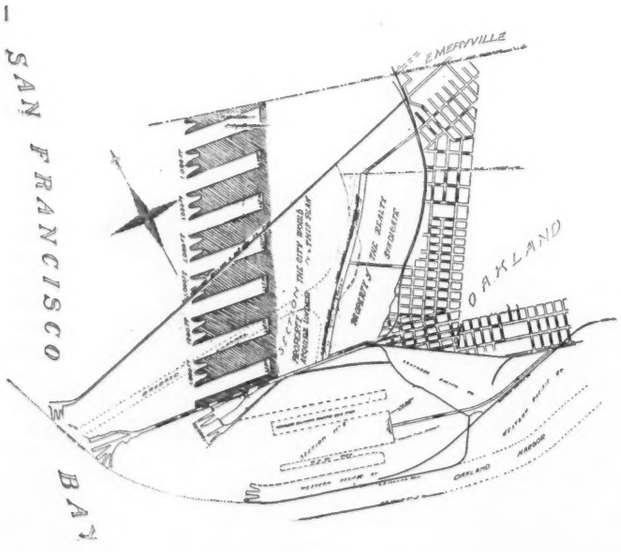
Buffalo, N. Y.—A decision has been handed down by the Public Service Commission which directs the International Railway Company to carry only interurban passengers on Lancaster cars. It is ordered that Lancaster cars leaving and coming into the city shall carry signs reading as follows: "No city passengers carried on this car," and in addition, before cars leave terminals, and also when stopping for passengers on the outbound trip or discharging passengers on the inbound trip the conductors shall announce "No city passengers carried on this car." The company is required to give reasonable publicity to the rules through announcements in the Buffalo newspapers.

Jersey City Has Big Subway Plan

Jersey City, N. J.—Jersey City and the other progressive municipalities of Hudson County do not propose that all subway building shall be confined to Greater New York. A plan set afoot by members of the Jersey City Board of Trade has for its object the construction of a subway running the full length of Hudson County north and south, beginning at the Kill von Kull and terminating at Bergen County. The total length of such a subway would be nearly fifteen miles and the approximate cost $15,000,000. It seems like a large undertaking for Hudson County, but the situation has been pretty thoroughly canvassed by the leading members of the trade bodies interested. An effort will again be made to have a measure passed by the next Legislature authorizing the county to construct the underground road. Some of the advantages that will accrue from the undertaking are direct connections with the McAdoo tubes, the projected Hudson River bridge, the Staten Island ferry and with the different transportation lines that run northward from Hudson into Bergen County. It is proposed to form a league of all the improvement associations of the county and enlist the assistance of the Mayors of the different municipalities in pushing the project to a successful issue.

P-A-Y-E Cars on All Los Angeles Lines

Los Angeles, Cal.—"Pay-as-you-enter" cars are to be used on all the city lines in Los Angeles as quickly as they can be introduced. The first cars will be operated on the Central avenue line beginning May 15, when 27 of them will be put in operation. Notice of the change was given the City Council by J. J. Akin, Superintendent of the Los Angeles Railway, who appeared in person to ask that the existing ordinance relating to smoking on the cars be amended to allow smoking only on the front platform instead of only on the rear platform. On the new cars the rear platform is not to be occupied.



PLAN SHOWING OAKLAND MUNICIPAL WHARVES

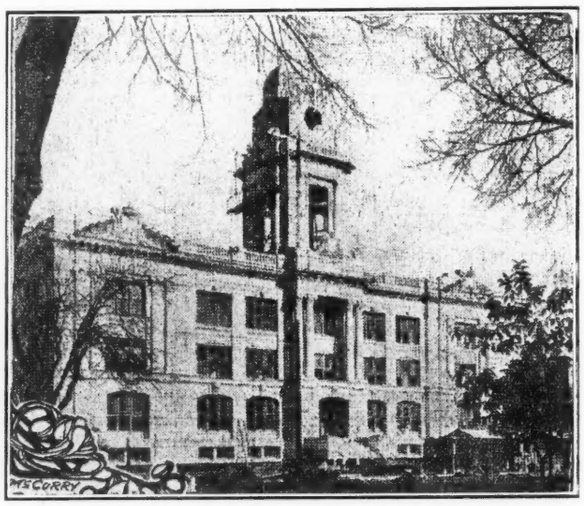
MISCELLANEOUS

Black Hand Letter for Cleveland's Mayor

Cleveland, O.—Mayor Herman C. Baehr has received a letter signed "Mafia" and written in red ink, which demanded $5,000 on pain of death. The Mayor was ordered to place the money in the hollow stump of a tree in Woodland Hills Park at a certain time. This letter is similar in character to those received some time ago by former Gov. Myron T. Herrick and George H. Worthington. United States Marshal Henry Davis asserts his intention of having the matter investigated.

Sacramento Has City Hall

Sacramento, Cal.—Sacramento's city officials have moved into their offices in the new City Hall. This is the first City Hall Sacramento has owned. Up to this time rented quarters have been occupied. The new building occupies the half block on the north side of I street, between Ninth



SACRAMENTO'S FIRST CITY HALL

and Tenth, facing the City Plaza, on which it was once proposed to erect the State Capitol of Sacramento, the State having gone so far as to accept the ground. It is an imposing building of terra cotta, on a foundation of cement and granite, and is surmounted by a clock tower. It cost more than $180,000, and is without an elevator for the present, the contractors and the Trustees having disagreed as to what should be the proper cost of that modern convenience.

Oakland to Build Mile of New Wharves

Oakland, Cal.—More than a mile of new wharves, with their accompanying sheds and warehouses, are to be constructed on the Oakland estuary within the next year. The municipal wharves, to be built with the money voted in the November bond issue, will take up 2,700 feet, a little more than half a mile. The Oakland Dock & Warehouse Company has begun work in the reconstruction of nearly a third of a mile of its wharves between Alice and Fallon streets. Similar work is being done by the Pacific Steel & Wire Company, the Hogan and Sunset Lumber Companies and other private corporations having frontages on the estuary. The wharf building is being undertaken because of the preparations of the Federal Government to dredge the channel to a depth of 30 feet to Ninth avenue and 25 feet from that point to the Tidal Canal. Almost $2,000,000 is to be spent by the city, and a like amount by private corporations on the construction of wharves on the inner harbor frontages.

Isle of Safety a Misnomer

Hartford, Conn.—The isle of safety on the corner of Pearl and Trumbull streets doesn't seem to regulate traffic, as was predicted in glowing terms. The Police Department will be asked to care for this. Danger of accidents is increased instead of reduced by a disregard of traffic rules since the isle was built.

Separators to Collect Gasoline Required in Garages

New York, N. Y.—The Municipal Explosives Commission, recently appointed by Fire Commissioner Waldo, held its first meeting at fire headquarters. A report was received from the Bureau of Combustibles on its investigation into the frequency of explosions in sewers and conduits on the upper West Side. The blame was put upon garages, which allow gasoline and other explosives into drains. The commission will order all garages to install separators, so that all explosive ingredients can be eradicated from their waste liquids before they drain into the sewers.

Wants Gasoline Tagged "Explosive"

Norfolk, Va.—If an ordinance drafted by Alderman B. A. Banks becomes a law gasoline, benzine and naphtha must be sold in receptacles marked "explosive" or painted red. Automobile tanks are to be exempt, as the ordinance covers only the receptacles in which the article is sold. The ordinance in full reads as follows:

An ordinance regulating the sale of benzine, naphtha and gasoline in Norfolk:

Be it ordained by the City Council of the City of Norfolk:

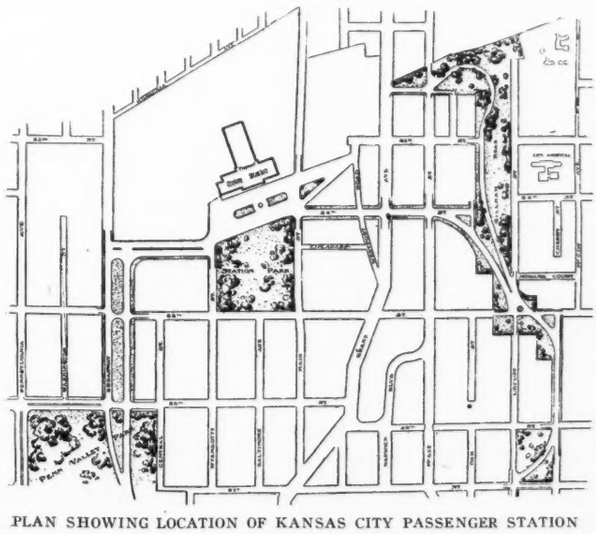
Section 1.—That no benzine, naphtha or gasoline shall be kept or sold in said city without all receptacles in which the same is purchased being plainly marked "explosive" or painted red.

Section 2.—That no kerosene oil or any other fluid whatsoever except benzine, naptha or gasoline shall be kept or sold in any such receptacle.

Section 3.—Any person violating this ordinance shall pay a fine of not more than twenty dollars ($20).

Union Passenger Station on a Boulevard

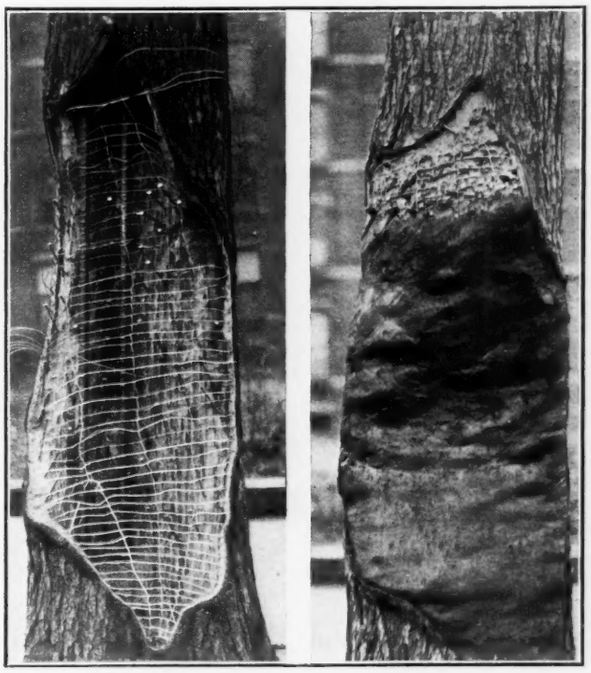
Kansas City, Mo.—A comprehensive plan for park and boulevard connections with the new Union Passenger Station has been outlined by the Board of Park Commissioners. In the station contract the Kansas City Terminal Railway Company gives to the city $450,000 for ground south of the station for a park to be improved by the Park Board. The plan prepared under the direction of the board is in line with this part of the contract and in addition connects this park and the station concourse, or plaza, with Robert Gillham road and Penn Valley Park. This connection will be a broad semi-circular drive with the station at the center. Twenty-fourth is to be merged into this parked driveway. The plan calls for the widening of Twenty-fourth street to 100 feet from Main street to McGee street, where it will broaden out as part of Robert Gillham road and extend south to Twenty-fifth street on an easy grade. The park south of the station will cover two squares extending from Wyandotte street to Main street and from Twenty-fifth street to Twenty-fourth street, which will form part of the concourse or plaza lying between the north line of the park and the south front or main entrance to the station. This plaza is to be given a formal treatment in landscape architecture. From Wyandotte street west to Broadway what would be Twenty-fourth street were it opened through will be widened to 140 feet, the terminal company giving 60 feet on the north and the city to add 80 feet on the south.



PLAN SHOWING LOCATION OF KANSAS CITY PASSENGER STATION

Saving Trees in Jersey City

Jersey City, N. J.—An example of what may be accomplished in tree-surgery is furnished in Paulus Hook Park. A tree which for years has stood on the curb of Grand Street in front of the park, and which, from being bitten by horses and scraped by trucks, was gradually decayed until a large cavity was formed on the lower part of the trunk, has been reclaimed by the Shade Tree Commission and the cavity filled, treatment that, according to City Forester Hastings, will preserve the tree for many years to come. The method of reclaiming a dead tree, or rather one in which a cavity has formed, is as follows: First, the decayed wood is entirely removed with chisels and the exposed portions treated with creosote or other fluid to kill disease and insects. Iron rods are then placed upright in the cavity and large nails driven in the heart of the tree and close together. Staples are then driven around the outer edge of the cavity and a netting of iron wire woven with the staple as a support. An opening is left in the top of the netting, and through this concrete is poured and firmly stamped down until the cavity is filled. The nails and iron rods serve to hold the concrete. After the cavity is filled, the outer covering is placed on over the netting. This is composed of one part cement, two parts sand and a little lamp black to darken the mixture. This is spread on with a trowel and follows as closely as possible the original contour of the tree. Great care is taken so that the cement does not project above the surface of the bark, so that in time the bark will spread and cover the treated cavity. To allow this the outside bark is cut away for about one inch all around the cavity. This exposed area is painted. It is said that this treatment will arrest decay and preserve indefinitely.



Courtesy Jersey City Journal

READY FOR THE CONCRETE THE CAVITY FILLED

Island for Civic Center

Spokane, Wash.—Havermale Island may become the civic center of Spokane, and on the island would be built the City Hall, the Public Library, the County Courthouse and other public buildings. At a meeting of the City Beautiful Committee of the 150,000 Club this idea of the civic center was proposed by Lloyd E. Gandy and the plan was received with hearty comments of approval. The plan is only a proposal on the part of Mr. Gandy and it was the sense of the committee that many things would have to be discussed and many obstacles removed before the idea could become practicable. The civic center plans of the 150,000 Club will be made a special order of business at a meeting of the committee early in May.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Contracts—Extra Work

Dady vs. City of New York.—Greater New York Charter provides that the city may be obligated to pay for contract work where the work and supplies involve an expenditure of more than $1,000 by contract founded upon competitive bidding by order of the appropriate head of the department for additional work for the purpose of completing any contract, not exceeding 5 per cent of the amount of such contract, and by contract without competition where the amount is less than $1,000, and the necessity therefor is certified to by the appropriate head of department and expenditure has been duly authorized and apportioned. A contract was made with the city for the erection of a pumping plant and infiltration galleries for $327,800. Within three months thereafter the parties made a supplemental contract for the installation of manholes near three wells driven by other contractors at an estimated cost of $7,160. The contractor during the progress of the work and pursuant to oral orders of the Chief Engineer of the Department of Water, Gas and Electricity performed extra work in connecting the wells with the pumping station erected by him, and in testing the same and constructing a coal box to be used in measuring coal. The extra work was not additional work done to complete the original contract, was not done pursuant to the contract founded upon competitive bidding, and the necessity therefor was not certified to by the head of the appropriate department. Held, that the mere oral order of the Chief Engineer was not equivalent to the formal and deliberate certification required by section 419, and the contractor could not recover therefor.—Supreme Court of New York, 121 N. Y. S., 860.

Improvement District—Contracts—Appropriations

Costello vs. Inhabitants of North Easton.—An improvement district, organized under Revised Laws, authorizing such districts to erect and maintain street lamps, establish and maintain libraries, to build and maintain sidewalks, and to employ and pay watchmen and police officers, was under no duty to act in performance of the purposes of its organization, and, though having power to raise and appropriate money, it could not contract for the employment of a police officer without appropriating money to the payment of the expense, nor was its power in this regard in any manner increased by the fact that it was also a fire and water district, organized under Revised Laws and Statutes of 1887.—Supreme Judicial Court of Massachusetts, 91 N. E. R., 219.

Amendment of Charter—Jurisdiction of Circuit Court

City of St. Marys et al. vs. Woods, Judge et al.—When a charter has once been granted to a city or town by special act of the Legislature, though the population of such city or town afterwards decrease below 2,000, this does not put it under the power of the circuit court to amend its charter.—Supreme Court of Appeals of West Virginia, 67 S. E. R., 176.

Surface Water—Damages

Lewis et al. vs. City of Springfield.—A complaint, alleging that defendant city so negligently graded certain streets that the water from other streets were conveyed into L street, near plaintiff's property, and that defendant negligently failed to construct sufficient gutters to carry the water off said L street, so that the same flowed on plaintiff's property, was sufficient, though it did not specifically allege that in the grading of the streets named defendant changed the flow of surface water by diverting it from its natural course, or that defendant gathered the water from its natural course and brought it down to plaintiff's property in greater volume than it had come prior to the grading. While a city is not liable for the incidental change of the flow of surface water, it may not collect such water into drains or sewers, and discharge it in unusual quantities onto private property.—Springfield Court of Appeals, Missouri, 125 S. W. R., 824.

Public Water Supply—Rates—Discrimination

People vs. Albion Water Works Company.—That a village water works company contracted to furnish water to the inhabitants of a village at a 12-cent rate in consideration of the payment to it by the village of a certain sum for fire protection was not a defense to a claim of discrimination in charging a State institution located within the village a 20-cent rate.—Supreme Court of New York, 121 N. Y. S., 660.

Rate of Taxation—Statutes

Mayor, etc., of Baltimore et al. vs. Knell et al.—Knell et al. vs. Mayor, etc., of Baltimore et al.—Acts 1908, providing for the classification for taxation of property located in the annex to Baltimore City, and providing, as a condition precedent to the classification of property as suburban, that the same shall abut on a public street or highway connected by public or private roads other than turnpikes on which tolls are charged within the city limits, requires property owners to pay taxes at the suburban rate where they have access to and from the old portions of the city over public and paved highways on which their property abuts, and over the connections designated in the act without the necessity of paying toll; and property abutting on a paved toll road, which connects with improved city streets leading into the old parts of the city, is properly taxed as suburban where the toll gate is so situated that the owners are not required to pay toll in going to and from any part of the old limits of the city.—Court of Appeals of Maryland, 75 A. R., 638.

Delegation of Authority—Contracts—Validity

Schwartz vs. City of Camden.—The Council of a city appropriated a specified sum for the purchase of additional land for the use of the water works. The water committee of the city appointed a subcommittee to contract for the purchase of such lands as the committee thought best. The committee, through the subcommittee, purchased a tract and reported the same to the Council, which confirmed the transaction. The subcommittee made a contract for the purchase of other lands, but no report of such purchase had been made to the water committee or to the Council. Held, that the contract made by the subcommittee was not enforceable against the city.—Court of Chancery of New Jersey, 75 A. R., 647.

Improvement Assessments—Due Process of Law

City of Paris vs. Brenneman.—Paris City Charter, empowering the City Council to order public improvements and assess the property benefited to pay the cost of part of the improvement, and directing the method of procedure, which provides for notice to the property owners assessed and hearing before the Council, but makes no provision for appeal therefrom, do not contravene Constitution, providing that the courts shall be open to every person for injury done to his lands, since the taking of the property under the taxing power is taking under due process of law.—Court of Civil Appeals of Texas, 126 S. W. R., 58.

Building Regulations—Fire Prevention

City of St. Louis vs. Warren Commission & Investment Co.—An ordinance, requiring every building more than three stories high above the basement, occupied for manufacturing or mercantile purposes, to have fire doors or shutters on every opening above the first story, is a reasonable police regulation, calculated to promote the general welfare of the citizens, and the individual rights of the citizen must be surrendered to the extent of compliance therewith.—Supreme Court of Missouri, 126 S. W. R., 166.

Council Meetings—Time—Custom

Mayor, etc., of City of Glasgow vs. Morrison-Fuller.—Where a city ordinance was passed at a meeting held on a date when the Council was not authorized by the charter to meet, its invalidity was not cured by the fact that the Mayor and all the Councilmen were present, nor by the further fact that it had been the custom of the Mayor and Council to meet on the first Monday in each month for 20 or more years, and that the meeting at which the ordinance was passed was held in accordance with such custom.—Kansas City Court of Appeals, Missouri, 126 S. W. R., 236.

NEWS OF THE SOCIETIES

National Association of Comptrollers and Accounting Officers.—The fifth annual convention of the association will he held at the Astor Hotel, New York City, June 9-11. The purposes of the association and the selection of New York as a meeting place are explained in part as follows by William A. Prendergast, Comptroller of New York, in a letter to the Board of Aldermen:

The prime purpose of this Association is "the consideration of improved methods of public finance and the extension of the movement for the installation of a uniform system of municipal and state accounting and reporting throughout the United States, and the promotion of legislation toward these ends."

Its membership is composed of comptrollers, auditors and other accounting or fiscal officers of cities, counties and States throughout the United States. There are now some eighty States and cities represented in the Association, and whose accounting officials are members thereof, among these being many of the larger and progressive cities.

The magnitude of the financial operations of this great metropolis, and the complexity and ramification of the administrative responsibilities, entering as they do into almost every activity of human endeavor, was the great attraction in determining the City of New York as the place for the Association's convention of 1910. Each and every comptroller, auditor and accounting officer who is a member of the National Association of Comptrollers and Accounting Officers appreciates the advantages to be gained by him in the carrying out of his own duties from a greater knowledge of the accounting procedure and the methods of financial administration pursued by the City of New York, in which every phase of municipal activity is reflected and where the transactions of a single department may require such an analysis of detail and constitute the center of an accounting action as elaborate as the entire bookkeeping system of some of the smaller cities.

The program is as follows:

Thursday, June 9—9.30 a. m. to 1 p. m., first business session; 2.30 p. m. to 5 p. m., second business session; 8.15 p. m., theater party.

Friday, June 10—9.30 a. m. to 1 p. m., third business session; 3.00 p. m. to 4.30 p. m., visit to New York Comptroller's office; 5.00 p. m., to Coney Island on Iron Steamboat; 7.00 p. m., informal dinner at Coney Island; 8.00 p. m., seeing Coney Island.

Saturday, June 11—9.30 a. m. to 1 p. m., fourth business session and election of officers; 2.30 p. m., seeing New York on 'bus or boat; 7.00 p. m., fifth annual banquet.

Playground Association of America.—The fourth annual congress of the Playgrounds Association of America will be held in Rochester from June 7 to 11 inclusive. Many subjects of vital interest to the children of the country will be discussed and it is hoped by the promoters of the congress that the attendance will embrace leading men and women from all over the United States. One of the subjects which will be discussed will be a sane Fourth of July. The dance hall problem, which is one of the embarrassing in many cities, large and small, will be considered as well as methods of outdoor education, morally and physically, of children.

North Dakota Good Roads Association.—The third annual meeting of the Good Roads Association will be held in Fargo in June. Secretary Baernstein, of the Commercial Club, has already sent out preliminary notices.

Engineers' Society of Pennsylvania.—The program for the second annual meeting at Harrisburg, June 1-4, is as follows:

Wednesday, June 1—9.30 a.m., opening of manufacturers' exhibit; 10.30 a.m., convention called to order in House of Representatives, Capitol Building; address of welcome, by the Governor; reply, by the president of the society and by the chairman of the convention; 11.30 a.m., meeting of county chairmen; 2 p.m., lecture; 3 p.m., business meeting of the convention; 8 p.m., smoker in the Board of Trade auditorium.

Thursday, June 2—10 a.m., lecture; 11 a.m., lecture; entire afternoon devoted to the inspection of the industrial exhibit; 8 p.m., banquet in Board of Trade auditorium.

Friday, June 3—10 a.m., lecture; 11 a.m., lecture; 2 p.m., lecture; 3 p.m., final business meeting of the convention; 8 p.m., illustrated lecture on "Sanitation," by Dr. Samuel G. Dixon, State Commissioner of Health, followed by a reception in the Governor's reception room.

Saturday, June 4—Excursion to McCall's Ferry, and inspection of 135,000 horsepower hydro-electric plant.

The concrete barn of the Central Pennsylvania Traction Company, where the industrial exhibit will be held, is 75 feet by 360 and there will be seventy-seven booths and over 60 per cent of the floor space has already been engaged. The exhibit will be opened by Mayor E. S. Meals and will remain open during the first three days of the convention. On Thursday, June 2, no lectures will be held and there will be an inspection of the engineering features, tools and instruments which will form the exhibit. The Central Pennsylvania Traction Company will run special cars which will carry convention members free of charge from the hotels, railroad stations and the Capitol to the exhibit hall.

Michigan Good Roads Association.—W. W. Todd, of Jackson, president of the Michigan State Good Roads Association, and Phillip T. Colgrove, of Hastings, have arranged the program for the convention of the association in Grand Rapids, May 12, and have forwarded it to Roy S. Barnhart, chairman of the convention committee of the Board of Trade, who has charge of the local arrangements for the convention. It is expected that the sessions of the body will mean much to the cause of good roads in the State, and it is probable that at the meeting a movement in favor of good roads of national scope will be launched, making Grand Rapids the city from which the national campaign starts. The program as now drafted is a most promising one. It is proposed that the address of welcome to the delegates will be made by Mayor George E. Ellis, with response by Phillip T. Colgrove. To United States Senator William Alden Smith is assigned the topic, "Needed National Good Roads Legislation," and that ten-minute addresses shall be made by Lawton T. Hemans, Patrick Kelley, Chase S. Osborne and Amos S. Musselman, the candidates for Governor being invited to attend and address the convention. Governor Fred M. Warner is scheduled to deliver an address, as is also the State Highway Commissioner, Horatio S. Earle, of Detroit, and William H. McDonald, of Hartford, Conn., president of the National Good Roads Association. There will be a series of short addresses by various speakers, with election of officers in the afternoon. Good roads men generally and supervisors will be invited to attend the meeting. The Automobile Club has charge of arranging for trips for the delegation, in order to observe roads in the vicinity, and the local committee will work out plans for entertainment.

Municipal Engineers of the City of New York.—At the meeting, April 27, William S. Ford presented a paper on the "Development of Jamaica Bay Into a Harbor for New York City." N. P. Lewis, Chief Engineer, Board of Estimate and Apportionment, joined in the discussion, as did Col. Black, U. S. A. At the meeting to be held May 4 George W. Tillson will present a paper on "The Asphalt Situation in Manhattan." A report has been made to the board of directors by a committee regarding the Raldins bill, now before the New York Legislature, regarding the licensing of engineers. The report was accepted by the directors and approved by the society. A resolution was passed authorizing the president, Arthur S. Tuttle, to appoint a committee of six to co-operate with other societies in the matter. The report is as follows:

The committee appointed to represent you in the matter of the bill now pending before the Legislature relative to licensing engineers, begs to report that they are of the opinion that a suitable plan governing the issue of a license to practice engineering is to be commended, but that the bill now under consideration is objectionable in many particulars, among which they would cite the following:

1. The definition of engineering is entirely too narrow and has been so drawn that it might be construed to include men occupying subordinate positions.
2. The definition of an engineer is not qualified in such a way as to relate only to those who act in a responsible capacity.
3. It is unreasonable to enact a law which would not take effect until three and a half years elapsed, or to make provision for the appointment of an examining board two and a half years before the license is required. This treatment may be taken as evidence that there is no occasion for hasty legislation.
4. All examiners, other than the members of the first board, should be licensed before being eligible for appointment.
5. The minimum age limit for candidates for licenses should be greater than 21 years, and each such candidate, irrespective of his educational equipment, should have had at least two years' experience in a subordinate capacity.
6. The educational provisions of the bill are unsatisfactory in many particulars, among which might be noted the unnecessary recognition given to correspondence schools and a lack of clearness in the definition of educational standards.
7. It is inadvisable to recognize any examining body other than the one specially created for this purpose.
8. The bill does not distinctly specify that four examinations annually should be held in each locality.
9. The bill contemplates a license to be issued "according to the qualifications of the applicant," while the act otherwise provides only for a general license.
10. The bill, in so far as it relates to the issue of licenses to those engaged in practicing engineering on the date when it becomes effective, should not stipulate the duration of the course given by the engineering schools whose degree is to be recognized and it should not provide for the issue of licenses to those practicing engineering and who have not received a degree, excepting in cases where the applicant has had at least five years' experience, of whch one has been spent in responsible charge of engineering work.

Under these conditions your committee recommends that the bill in its present form be opposed, and that the Society cooperate, in so far as practicable, with other recognized engineering organizations to the end that a suitably modified act may be prepared for submission to the next Legislature.

International Road Congress.—Delegates to the second International Road Congress, to be held at Brussels, Belgium, July 31 to August 8, 1910, are being designated by the governors of the States and Territories of this country and of the Canadian provinces. The request that the delegates be appointed has been made by the American Road Builders' Association.

American Water Works Association.—The thirtieth annual convention of the American Water Works Association met in New Orleans on Tuesday to Friday, April 26 to 29. When the convention opened there were registered about 125 corporate and 70 associate members and 75 guests, which numbers were later increased to 175, 99 and 100, respectively, in addition to about 100 New Orleans guests. The meetings were held in an auditorium on the top floor of the Grunewald Hotel, which was most excellently adapted to the purpose in size, seclusion and quietness from outside noises. The exhibits were on the second floor, where a display was made about on a par with those of the past year or two. Altogether the accommodations were perhaps the best the society has had.

The association selected Rochester, N. Y., as the next meeting place, by the close vote of 86 to 80 in favor of Richmond, Va. The officers elected were: President, John W. Alvord, Chicago; First Vice-President, Alexander Milne, St. Catherines, Ont.; Second Vice-President, Dow R. Gwinn, Terre Haute, Ind.; Third Vice-President, Robt. J. Thomas, Lowell, Mass.; Fourth Vice-President, John A. Affleck, Harrisburg, Pa.; Fifth Vice-President, Geo. G. Earl, New Orleans; Secretary-Treasurer, J. M. Diven; Finance Committee, H. E. Keeler, Chas. R. Henderson, Leonard Metcalf.

It had been expected that a committee on reorganization, appointed last year, would report upon a plan for widely extending the activities of the society; and President Mason, in his annual address, had suggested the possibility of securing permanent headquarters in a proposed George Washington Memorial Building; the idea, endorsed by several national organizations, being to erect in Washington, D. C., a building for the use of scientific and educational societies. This committee delayed its report until the finance committee had made a careful analysis of the association's financial condition. This analysis showed this condition to be so critical that the reorganization committe advised against any branching out at present, and the Executive Committee recommended that an assessment of $5 be collected from every member of the association. This, if paid by all of the 947 members, would clear off the debts of the society and give it a fresh start. It also seemed necessary to cut down expenses, and it was decided to discontinue the sending out of advance copies of papers, to have the publication committee revise and prune papers presented, and economize in other ways. In membership, however, the society is in a flourishing condition, having added 90 active and 14 corporate members at this convention.

The address of welcome by Mayor Martin Behrman was followed by the election of new members, and these by the President's annual address. The committees on publication, electrolysis, fire protection, depreciation and standards presented their reports at this meeting. The first expressed the desire that some arrangement be made by which it can read and edit the papers presented. At present they do not receive the papers in time for this. The committee on electrolysis reported the latest court decision in the Peoria case, and some discussion was had on the willingness of trolley companies to take necessary precautions to avoid electrolysis to pipes. Mr. John W. Alvord, chairman of the committee on depreciation, read a paper as a preliminary report, outlining the present conceptions of depreciation, physical, functional and contingent.

The report of the committee on uniform annual reports had already been printed and distributed, and the afternoon session was opened by Chairman Albert H. Wehr giving an explanation of the system proposed. Following a brief discussion of this and the announcement by Mr. Wehr that a conference on standard accounts and reports would be held May 24 and 25 at the New Willard Hotel, Washington, by representatives of public service commissions, interested societies and individuals, the association authorized Chairman Wehr and the incoming president to represent it at the conference, with power to act.

The paper of Charles B. Burdick on the "Use of Electricity in Water Works Pumping," was the only one read at this session. By a motion of Mr. Leisen and after considerable discussion as to details, the President was instructed to appoint a committee of three to endeavor to advance the project for a National Bureau or Department of Health, having reasonable control over interstate stream pollution. At a later session the President announced as the members of this committee Messrs. Theo. Leisen, M. N. Baker and Morris R. Sherrerd. During the discussion on this matter the President and several other members expressed their opposition to the wholesale prohibition of discharging sewage into streams. The wording of the motion was: "Resolved, That this association favors the creation of a national bureau or department of health, with a reasonable control over interstate stream pollution; and that the president of this association appoint a committee of three to further the objects of this resolution; said committee to have the power to confer with any similar committee of any other organization looking to the same end."

The largest attendance of the convention was accorded to the lecture of Mr. Geo. G. Earl, describing the drainage, sewerage and water works improvements of New Orleans during the past few years, during all of which time he has been the chief engineer of the board having the work in charge. The excellence of this work, and especially the modesty of the narrator in describing impersonally the work he had done, were largely influential in securing for him the election as vice-president against two competitors. This description and a dance which followed were attended by more than 300.

On Wednesday morning A. W. Cuddeback presented a paper entitled "Care and Method of Handling Meters in Service." He stated that the system which he described included three towns under one management, in which were 12,000 meters. Meter readers changed routes each quarter, so each became familiar with all routes, and was checked by another reader next quarter. Routes were laid out supposed to be covered in 8 hours, having 100 to 150 meters per route, averaging 120; all meters being in cellars. Mr. Leisen stated that the same plan of alternating routes was followed in Louisville also.

This was followed by a paper by Dr. W. C. McMurtrie entitled "Determining Sources of Typhoid Fever," describing the study of the subject at Washington, D. C., by a commission, and at Pittsburg by the Sage Foundation. A brief progress report of the committee on water works standards was read by Mr. Leisen, a member of the committee, stating that hydrant specifications and those for purchasing coal by heat units were receiving special consideration.

The finance committee reported a deficit of about $3,500, most of which was in the secretary's salary. The recommendations for meeting this condition have already been referred to. The secretary's report showed a net increase in membership from 896 a year ago to 941; 31 having been dropped for non-payment of dues. Certain items of expenditures were $2,519 for printing the proceedings and $604 for printing and distributing advance copies of the papers. Dues were paid to the amount of $4,343.

On Wednesday evening Mr. Allen Hazen gave an illustrated talk on the Springfied, Mass., water supply and the Panama Canal, which was rendered very interesting by the numerous lantern slides.

On Thursday morning papers were read and discussed, as follows: "Conservation of Potable Waters," by J. M. Diven; "The Cost of Furnishing Water," by Daniel W. Mead; "A Co-operative Water Works Franchise," by J. W. Alvord. "Municipal Ownership," by Park Woodward, and "Baltimore County Ozonation Plant," by A. E. Walden, were read by title. Mr. Mead's paper received considerable discussion as to what items were and what should be included in cost. Attention was called by Messrs. Wood and Alvord to the relatively large capital cost of water works plants as compared to other enterprises, and the consequent great effect of including or neglecting interest in estimating cost, the latter of which is common in municipal plants. It was also stated as the opinion of several that too frequently the charges were not made to include losses from leakage and otherwise, and were even based on pump records with no allowance for slippage, rather than on water delivered. Mr. Alvord's paper also received discussion by several members, Mr. Maury stating that he had already applied the proposed form of franchise in one case, although decision to use it has not yet been reached. A paper by Col. H. N. Ruttan, of Winnipeg, was next read, and following this a talk by Mr. W. F. Wilcox, of Meridian, Miss., describing the use of creosote in reservoirs. (See MUNICIPAL JOURNAL AND ENGINEER for December 8, 1909.) The effect of this upon algæ was first discovered by Mr. Wilcox while using it to kill grass growing in the inlet to the reservoir. In addition to destroying the algæ, one of the phenols, which floated upon the surface, apparently rendered the reservoir uninhabitable for water snakes, eels, turtles, and the like. No trace of the creosote was discernible in the tap water. Reference was made to "frog fences" of netting or boards as being used around many southern reservoirs to keep out frogs and snakes.

The two sessions of Friday brought out more discussion than those of any previous day, and were consequently more interesting to those present. In the morning there were read "A Railway Episode," by Willis B. Durlin; "Action of St. Louis Water on Metals

and Alloys," by Wilson F. Monfort; "Extension of Mains," by W. J. Spaulding: "Establishing Water Rates, and What Revenue Warrants Extension," by J. W. Ledoux; "Experience with Cement Mains in Rahway, N. J.," by William Bishop, and "Removal of Iron in Organic Combination; A Problem and a Solution," by John R. Downes, of the Canal Zone. The two last were read by title only.

In discussing the first of the above, it was stated that the New York Central and some other railroads require that all water or gas pipes laid under their tracks be enclosed in a line of larger pipe carried three feet beyond the tracks each way. Instances were cited where municipal departments required the companies to attend to protecting their tracks at their own cost, as in Arkansas and Buffalo, N. Y., the rights of the city to lay pipes in streets under tracks being acknowledged. Mr. Durlin and others, however, believed that private companies could not claim these rights in a street, as could a city; one superintendent stating that he relied upon the city to settle any difficulty his company might have in crossing railroads.

Mr. Ledoux discussed a method suggested by him for fixing water rates on a sliding scale, seven items being involved, of which the consumption was but one, certain of the others being fixed. He suggested two straight-line formulas for the purpose, one for low and the other for high rates of consumption. He considered one of the greatest difficulties to be the decision as to proper depreciation rates. Flat rates he considered to be unjustifiable under any conditions. The author also discussed the subject of the amount of revenue which must be assured from a given extension before it would pay to make it. He believed that this should be 15 to 25 per cent of the cost in order to cover interest and depreciation, cost of maintenance, etc., as well as the water used.

The paper by Mr. Spaulding, which followed, was on much the same subject, which was discussed at some length. The author's idea was to have the entire cost of each extension paid for by the frontage owners, as are sidewalks and street paving in some cities, since the presence of the pipe adds value even to a vacant lot. The strongest argument (for a municipal plant especially) is that all desiring water service can have it at once; whereas if the pipe must be paid for by city or department out of a limited appropriation, many must frequently wait some time for their turn. The author also considered it unfair that an owner or dealer should have $25 or more added to the value of his lot without any expenditure on his part, but at the expense of the city. Mr. A. H. Wehr, chairman of the Baltimore County Water & Electric Company, stated that his company requires owners to deposit $1 per foot of main when it is laid in front of vacant property. The owner is then given a credit against this of $50 for each house built and using water; also later, $50 per year for each house using water throughout the year, this being continued until the deposit has been entirely refunded; but if this does not occur within five years the balance is forfeited to the company. Another member named an instance where development companies pay the entire cost of the pipe, the money being refunded when the water rents pay 25 per cent of this. The city of St. Paul collects 10 cents per front foot per year for extensions; but as this sum is added to the general tax and collected with it, few owners realize that they pay it.

The question box contained several inquiries, some of which had been discussed earlier. As to tapping pumping mains, instances of the practice were cited and no objections to it advanced. The use of pneumatic calking hammers was stated by one member to have split all the bells upon which he tried it, while Vice-President Milne had used it for all his calking last year without a split bell or a leaky joint. Apparently it is a good tool if used with care and judgment.

Considerable discussion was given to the question of what kind of pipe to use in a salt marsh; the only facts brought out relating to kinds which should *not* be used. Cast iron became soft at Charleston, S. C., Perth Amboy and other places. Wood stave was not practicable because of the iron bands. Several mentioned that the iron pipe gave out along the top, where water did not touch it; which suggested to Mr. W. F. Monfort that local electrolysis was probably the cause.

The practice of permitting establishments having private fire systems to connect them with the city mains, however indirectly and with check or double check or even gate valves between, which formed the subject of a paper by Alexander Milne, was most strongly condemned by Vice-Presidents R. J. Thomas and Dow R. Gwinn and Messrs. H. N. Ruttan, E. M. Peck and others, who had no confidence in the action of any check valve. A description of the "Experiences and Results with Municipal Water Softening" at McKeesport, by Alexander Potter, brought out some ideas concerning chemicals in water supplies and deposits of them in pipes and meters. The suggestion that the increase of bacteria in the water while passing through the plant might be due, as at Columbus, to the growth of lime bacteria in the lime sludge, brought out the statement from Mr. Monfort that these bacteria seem to die out when the temperature is below freezing or above 70 degrees, and so multiply most abundantly in the spring and fall.

Papers by Dow R. Gwinn on "Advertising the Water Works Business," and by E. E. Davis, describing the Settling Basins at Richmond, Va., received some discussion. During the last session honorary membership was conferred upon Mr. L. H. Gardner.

During the convention the excellent exhibits, which we will refer to next week, attracted much attention from the members; especially some novelties, which we hope to describe later in our Municipal Appliances columns. Several large sales were made during the convention by the exhibitors.

The entertainment features, which were provided by the city of New Orleans and the Water Works Manufacturers' Association, consisted of trolley and automobile rides and a card party for the ladies; a ride to and luncheon at the city filter plant; an afternoon on the Mississippi River, with refreshments and dancing; dancing and refreshments in the hotel auditorium, and free admission to two of the vaudeville theaters.

Probably the most distant city to send a delegate was Winnipeg, Man.; and four other Canadian cities were represented. About seventy-five traveled by special train from New York, which train, with utter disregard of the reputation of the Southern Railroad, got them in New Orleans 10 minutes ahead of time. That reputation it redeemed afterward, however, as the train which carried most of those who returned by that route ran into three wrecks which delayed it 7 hours. About fifty returned to New York and adjoining States by boat, leaving New Orleans Saturday.

Oklahoma State Firemen's Association.—The seventeenth annual convention will be held June 7, 8 and 9 at Tulsa. A number of prizes will be given for hose contests, hook and ladder racing and other races and sports. The following topics will be discussed:

"In Cities Where an Efficient and Complete High Pressure System Has Been Installed, Is It Safe to Discard Steam Fire Engines and Depend Entirely Upon the High Pressure System?" by Chief M. H. Kesler, Oklahoma City.

"The Necessity of the State Fire Marshal," by Chief L. A. Brown, Shawnee.

"Spontaneous Combustion and Its Cause," by Chief W. C. Gruber, Guthrie.

"Best Methods in Small Cities for Fire Prevention," by Chief Ed. Snow.

"Care and Training of Fire Horses," by Chief Ira Holbrooke, McAlester.

"Fire Hose, Proper Care and Treatment," by Chief J. Bart Foster, Chandler.

"Volunteer Firemen and What It Really Means," by Chief A. Meyers, Stillwater.

"What Knowledge Each Fireman Should Have in First Aid to the Injured, and Why," by Chief G. E. Schwartz, Bartlesville.

"Are State Firemen's Tournaments Beneficial to Departments and Companies?" by Chief T. E. Sampson, Duncan.

"How to Maintain a Progressive Spirit Among the Volunteer Fire Departments," by Fire Marshal James Clark, Frederick.

Fire alarm system, automobile apparatus, insurance interest, remarks and discussions by representatives of fire alarm and automobile apparatus and underwriters.

Texas State Firemen's Association.—The Hillsboro Fire Department have made arrangements with the railroad for two passenger coaches for the use of its members on their trip to Temple to attend the annual meeting of the State Firemen's Association, May 10-12. They desire to have the next convention at Hillsboro, which has never had a State Firemen's convention, although the local department is one of the best in the State. Hillsboro has a new City Hall and fire station.

People's Gardens of Washington.—To make the vacant lots of the city available as gardens for those who have no garden space of their own; to build up, wherever possible, recreation gardens for the use of the people of the neighborhood in which they shall be located; to encourage the beautification of the back yards of the city, and to stimulate a general interest in the landscape gardening of the city and surroundings are the objects and purposes of "The People's Gardens of Washington." Officers elected are: President, David Fairchild; first vice-president and chairman of the Garden Council, Mrs. S. F. Emmons; second vice-president, Mrs. Herbert Parsons; third vice-president, Frank B. Noyes; fourth vice-president, Miss Martha Phillips; recording secretary, Edward C. Dean; treasurer, Robert F. Miller.

Municipal Art Society of Baltimore, Md.—The Home Garden committee has sent out many copies of letters requesting householders to co-operate with them in improving the appearance of the city by placing boxes with flowers in their windows. The secretary will supply any householders, who so desire, with estimates on window boxes already planted. A type of box used by the Flower Guild, of New York, which will not deface the front of the house is recommended.

Calendar of Meetings

May 5-7.
American Electrochemical Society.—Annual Meeting, Pittsburg, Pa.—Jos. W. Richards, Secretary, South Bethlehem, Pa.

May 6-7.
Appalachian Engineering Association, Annual Meeting, Winston-Salem, N. C.—Harry M. Payne, Secretary, Morgentown, W. Va.

May 17-19.
National Fire Protection Association.—Annual Meeting, St. Louis, Mo.—T. C. Martin, Secretary, 29 W. 39th st., New York.

May 18.
American Society of Civil Engineers.—Regular Meeting, Society House, New York.—Charles Warren Hunt, Secretary, 220 W. 57th st., New York, N. Y.

May 23-28.
National Electric Light Association.—Annual Meeting, St. Louis, Mo.—T. C. Martin, Secretary, 29 W. 39th st., New York.

May 27-29.
Louisiana State Firemen's Association.—Fifth Annual Convention, Lafayette.—Wm. J. Kleinpeter, Secretary, Gretna, La.

May 31-June 3.
American Society of Mechanical Engineers.—Spring Meeting, Atlantic City, N. J.—Calvin W. Rice, Secretary, 29 W. 39th st., New York.

June 1-4.
Engineers' Society of Pennsylvania.—Second Annual Convention, State House, Harrisburg, Pa. — Edward R. Dasher, Secretary.

June 2-3.
North Carolina Municipal Association.—Annual Convention Winston-Salem, N. C. O. B. Eaton, Secretary, Mayor Winston-Salem, N. C.

June 7-11.
Playground Association of America.—Fourth annual congress, Rochester, N. Y. H. S. Braucher, Secretary, 1 Madison avenue, New York City.

June 9-11.
National Association of Comptrollers and Accounting Officers.—Fifth annual convention, Hotel Astor, New York City.

June 21-24.
American Society of Civil Engineers.—Annual Convention, Chicago, Ill.—Charles Warren Hunt, Secretary, 220 W. 57th st., New York City.

June 22.
New England Water Works Association.—June Outing, Providence, R. I.—Willard Kent, Secretary, Narragansett Pier, R. I.

June 21-23.
Indiana Municipal League. — Annual Convention, Richmond.—Baltz A. Bescher, Secretary, Richmond, Ind.

June 22-24.
American Institute of Chemical Engineers.—Semi-annual meeting, Niagara Falls, N. Y.—J. C. Olsen, Secretary, Polytechnic Institute, Brooklyn, N. Y.

June 23-25.
Society for the Promotion of Engineering Education.—Annual meeting, Madison, Wis.—Henry H. Norris, Secretary, Cornell University, Ithaca, N. Y.

June 27-30.
American Institute of Electrical Engineers.—Annual convention, Jefferson, N. H.—R. W. Pope, Secretary, 33 West 39th st., New York City.

June 28-July 2.
American Society for Testing Materials. Annual meeting, Atlantic City, N. J.—Edgar Marking, Secretary, University of Pennsylvania, Philadelphia, Pa.

June 30-July 1.
American Society of Heating and Ventilating Engineers.—Semi-annual Meeting, St. Louis, Mo.—W. M. Mackay, Secretary, P. O. Box 1818, New York, N. Y.

August 23-26.
International Association of Fire Engineers.—Annual Convention, Syracuse, N. Y.—James McFall, Secretary, Roanoke, Va.

August 23-26.
League of American Municipalities.—Annual Convention, St. Paul, Minn.—David E. Heineman, President, City Hall, Detroit, Mich.

September 21-23.
New England Water Works Association.—Annual meeting, Rochester, N. Y.—Willard Kent, Secretary, Narragansett Pier, R. I.

October 11-16.
American Society of Municipal Improvements.—Seventeenth annual convention, Erie, Pa.—A. Prescott Folwell, Secretary, 239 W. 39th st., New York, N. Y.

PERSONALS

ARNETT, GEORGE W., Chief Engineer of the Volunteer Fire Department of Lambertville, N. J., has been re-elected, while Thomas Thorne has been elected Fire, and Joseph N. Hazen Second Assistant Chief.

BAILY, T. C. J., Assistant Engineer in the Sewer Department, Washington, D. C., has been promoted to the office of engineer in charge of street extensions. John B. Gordon will be made Assistant Engineer of the Sewer Department, at $2,100 a year; J. R. Whelpley, Assistant Engineer, at $1,800; W. S. Sheets, Inspector of Underground Construction of Public Service Corporations at $6 per day; A. G. Dunn, General Inspector, $1,500 a year.

BARNES, J. V., Hutchinson, Kan., has been engaged by the city of McPherson, Kan., as engineer at the water and light plant, and will supervise the installation of more modern pumps and the remodeling of the plant.

BARRETT, ROBERT L., Alexandria, Va., has been elected a member of the Board of Police Commissioners from the Second Ward, to fill the unexpired term of the late Zora Hill.

BECK, DR. CHARLES A., Wilmington, Del.; Dr. Henry A. Cleaver, J. Thomas Hall, and Lewis A. Hillersohn, have been named by Mayor Spruance as a new Board of Health.

BENNER, D. W., Kyle, Tex., has been appointed Chief of the Fire Department.

BISHOP, DR. LEMUEL A. H., Dover, Del., Dr. Presley S. Downes, Dr. Wm. F. Davis, Herman C. Taylor, E. L. Clarke, R. R. Kenney, Rev. Joseph Brown Turner and W. S. Bostic have been named as a Board of Health.

BLYSTONE, WALTER I., Jamestown, N. Y., has been nominated and confirmed as President of the Board of Estimate and Review.

BOSTEC, JOHN, Dover, Del., has been elected Chief of the Fire Department; Hiram B. Donoho, First, and Joseph Steel, Second Assistant.

BRAINE, BARNABAS, Knoxville, Tenn., has been elected a member of the Water Commission by Council over D. M. Chambliss and H. O. Nelsen, and will fill out the unexpired term of E. G. Oates.

BRITT, DUDLEY D., Clarksburg, W. Va., has been appointed City Engineer.

BROOKS, WILLIAM F., Mayor of Cambridge, Mass., has renewed the oath of office; Edward B. James has been re-elected President of the Board of Aldermen, and Irving N. Linnell elected President of the Common Council.

BURK, J. F., Chico, Cal., has been elected Chief of the Fire Department; Lyle Mecum, First, and Charles D. Shearer, Second Assistant Chief.

COAKLEY, JOHN J., Utica, N. Y., has been appointed Chief of the Police Department, succeeding Michael F. Brophy, resigned.

CONBOY, MICHAEL J., Captain of Police of San Francisco, Cal., has been sentenced to seven years in San Quentin prison, having been convicted of manslaughter for killing Bernard Lagan.

DUPRAW, JOHN, Durango, Col., has been elected Street Supervisor.

EATON, R. W., Chief of Police of Topeka, Kan., has resigned.

FENNESSEY, JOHN C., City Clerk of Eau Claire, Wis., for ten years, was defeated when officers under the new commission government were elected.

GILLESPIE, H. T., Durango, Col., has been elected City Marshal.

HAK, JOHN, Clyde, N. Y., has been elected Chief of the Fire Department for the 15th consecutive year.

HAMMOND, DR. JOHN H., Georgetown, Del.; Charles T. Purnell, Joseph G. Green and John C. Abbott, have been named as a Board of Health by the town.

HART, DR. L. D., Mayor of Morehouse, Mo., was shot and killed by Claud Hay, Editor of the Morehouse Hustler, as a result of a political feud of long standing.

HARWOOD, S. J., Superintendent of Streets of Newport News, Va., has resigned to become general manager of the Fireside Union, a local life insurance company.

HEYER, ROBERT, Cuero, Tex., has been elected Chief of the Fire Department; Louis Budd, First, and Albert Frantwent, Second Assistant Chiefs; Will Barnes, Secretary, and Henry Frobese, Treasurer.

JESSEPH, M. E., Spokane, Wash., has been appointed private secretary to Mayor N. S. Pratt, to succeed John C. Lee.

JOHNSTON, EDWARD F., and John T. Keavey, Wilmington, Del., who were elected Second Assistant Engineers of the City Engineering and Surveying Department on its reorganization, two months ago, have resigned.

KELSEY, LOUIS C., M. Am. Soc. C. E., Salt Lake City, Utah, has been engaged by the City of Union, Ore., to design and superintend the construction of a hydro-electric plant and water works system, to cost approximately $60,000

KLINEDINST, DANIEL G., West York, Pa., has been elected Supervisor and Garbage Collector, and will receive $25 per month for the collection of garbage; last year he received $18 per month.

KNIGHT, M. DONALDSON, Rockville, Md., has been elected Road Superintendent for Montgomery County, a position created by the last Legislature, which carries a salary of $1,800 per annum.

LEE, JOHN A., Jamestown, N. Y., has been named by Mayor Carlson as Street Superintendent and confirmed by Council.

MACARTNEY, MARTIN, has been appointed City Engineer of Spokane, Wash., by Mayor N. S. Pratt, at a salary of $6,000 per annum.

MANLEY, L. B., Duluth, Minn., has been elected president of the Board of Light and Water Commissioners.

MILLER, TAYLOR, Member of Council of Salina, Kan., for nearly a quarter of a century, was defeated at the election under the commission by Henry Blatherwick.

MORRILL, FRED B., Spokane, Wash., has been named as Corporation Counsel by Mayor N. L. Pratt.

MULLANEY, JOHN J., ex-Councilman of Lawrence, Mass., has been named as Chairman of the Police Board by Mayor Meehan, to succeed Frank K. Stearns.

NOLEN, JOHN, Cambridge, Mass., has been engaged by the City Improvement Association of Scranton, Pa., to prepare plans and make recommendations for the betterment of the city.

PARKER, E. R., Houston, Tex., has been appointed Fire Marshal.

TAYLOR, J. H., Rome, Conn., has been elected a member of the Board of Public Works, vice Judge Joel Branham, resigned; he is president and general manager of the Rome Manufacturing Co.

WALKER, THOMAS, Guyandotte, W. Va., has been elected Street Commissioner over James M. Price.

WELCH, JOHN W., Milford, Del., has been elected President of the Board of Health, and Dr. William Marshall, Secretary.

NEW MAYORS ELECTED

Dunsmuir, Cal.—Levy, re-elected.
Lincoln, Cal.—H. S. Williamson, re-elected.
Redding, Cal.—George H. Gronwoldt, re-elected.
Berkeley, Cal.—J. Frank Roberts.
Emeryville, Cal.—W. H. Christie, re-elected.
Cranston, R. I.—Edward M. Sullivan.
Frederick, Md.—William J. Freeze.
Laurel, Md.—William Gilbert, re-elected.
Manning, . C.—A. C. Bradham.
Gainesville, Fla.—Christopher Matheson.

Texas Mayors

Alto—W. R. McCuistion.
Amarillo—James H. Patton.
Aransas Pass—W. H. Werner.
Arlington—A. Cliff Barnes.
Baird—S. Boyer.
Bastrop—J. N. Jenkins.
Big Springs—L. T. Deats.
Beaumont—Emmett A. Fletcher.
Bridgeport—J. L. Crawford.
Bryan—J. T. Maloney, re-elected.
Brownsville—Benjamin Kowalski.
Brownwood—L. May, re-elected, no opposition.
Celina—C. D. Roberts.
Childress—J. W. Mitchell.
Clarksville—Charles E. Terry.
Cleburne—Breech.
Coleman—J. A. B. Miller.
Denton, O. P. Poe.
Dublin—George Wray.
Eagle Pass—W. A. Bonnet.
Eastland—Charles Pettit.
El Campo—E. L. Connell.
Elgin—Charles Statz over M. P. Hill.
Elgin—Charles Gillespie over M. P. Hill.
Enloe—N. J. Hule.
Ennis—T. H. Collier.
Farmersville—J. P. Huddleston.
Frost—C. C. Stevenson.
Galland—George Alexander.
Garrison—Eli W. Bostick.
Gatesville—Thomas R. Mears.
Georgetown—R. E. Ward.
Goldthwaite—James Rahl.
Gonzales—August Kleine.
Grady—S. A. Conley.
Grand Prairie—P. A. Geeo.
Grapevine—B. H. Yaney.
Greenville—T. E. Byrd.
Groesbeck—A. M. Blackmon.
Harlingen—I. B. McFarland.
Hereford—J. H. Head.
Hico—J. P. Rodgers.
Honey Grove—S. H. Gardner.
Italy—J. M. Parker.
Kaufman—George G. Shaw.
Killeen—Dr. D. L. Wood.
Lone Oak—A. Payne.
Laredo—Robert McComb.
Liberty—J. A. Richardson.
Llano—L. J. Dalrymple.
Lockhart—A. F. Fields.
Langrew—G. A. Bodenheim.
Looling—W. F. Rideout.
Mercedes—W. J. Dafarce.
Mexia—W. M. White.
Midland—J. A. Haley.
Munday—John F. Switzer.
Nacogdoches—George Mathews.
Naples—T. C. Wickenden.
Navastota—E. A. Scott.
New Braunfels—C. A. Jahn, re-elected.
Orange—E. W. Brown, re-elected.
Paris—Ed. H. McAustrom, re-elected.
Pecos—S. H. Prewitt.
Pilot Point—S. I. Newton.
Pittsburg—J. D. Bass.
Port Arthur—P. C. Pfeiffer, re-elected.
Rising Star—Noble Gray.
Roscoe—E. I. Hill.
San Angelo—J. D. Hassell.
Santa Anna—W. B. Woodward.
Snyder—Mark Taylor.
Sniner—L. Trautwin.
Taylor—E. M. Still.
Temple—Fred P. Hamill.
Tioga—J. Leonard Webb.
Tyler—W. E. Burgess.
Waco—H. B. Mistrol.
Wetherford—Joel W. Hicks.
West La Porte—Mayor Brick, re-elected.
Wharton—G. S. Gordon.
Whitewright—C. W. Bryant.
Whitney—Maj. J. K. Dunn.
Wichita Falls—T. B. Noble.
Wylie—J. B. Baskett, re-elected.
Yoakum—Dan T. Price.

New Presidents of New York Villages

Victor—George W. Hill over John M. Ladd.
Dresden—Frederick H. Remer.
Dundee—John J. Murphy.
Rushville—A. J. Halstead.
Waterloo—John Kropf.
Phelps—M. T. O'Brien.
Bridgeport—Lewis W. Udell.
Walcott—W. J. Clapper over J. R. Waldorf.
Cohocton—A. L. Schultz. Street Commission, William Ersfield.
Honeoye Falls—Levi Hill.
Webster—William Jayne. Street Commissioner, A. S. Broughton.
Clyde—Joseph E. Murphy.

TRADE NOTES

Cast Iron Pipe.—Chicago: Several large lettings are pending. Gas companies are ordering pipe freely. Quotations: 4-inch, $28.50; 6 to 12-inch, $27.50; 16-inch and up, $26.50. Birmingham: Demand is good and supplies of stock have been cleaned up. Quotations: 4 to 6-inch, $24; 8 to 12-inch, $23; over 12-inch, $22. New York: Municipal orders are coming in slowly this spring. There is a good volume of business from private water and gas companies. Quotations, 6-inch, $25.50 to $26.

Lead.—Consumers are holding back orders for lower prices. Quotations: New York, 4.40c; St. Louis, 4.25c.

Water Works Devices.—The H. Mueller Manufacturing Company, Decatur, Ill., Eastern office, 254 Canal street, New York City, has issued a booklet to remind water works engineers and officials of the various supplies and equipment manufactured by the company, which they are likely to need during the coming summer. These include water tappers, drilling machines, corporation cocks, brass water connections, wipe joint goosenecks, curb cocks, lead flange work, water main calking sets, pipe jointers, pipe tongs, chain blocks, water strainers, pressure regulators and self-closing cocks.

Cement Laboratories.—The Pittsburg Testing Laboratory, with general offices at 325 Water street, Pittsburg, Pa., announces that on account of the rapid growth in its cement testing department it has opened cement laboratories, with full facilities, in charge of competent cement chemists and cement testers, at 511 Omaha Building, Chicago, and 309-310 Praetorian Building, Dallas, Tex. It also has cement laboratories at Easton, Pa.; Pittsburg, Cincinnati, Birmingham and San Francisco, as well as cement chemists located at a large number of the different cement mills. It is prepared to test cement in its laboratories, or to make mill inspection of cement at any of the leading cement mills.

Wood Pipe Plant.—The new plant which the Pacific Tank and Pipe Company has just put in service at Portland, Ore., is electrically operated throughout. A part of the equipment, such as special machines for tank and pipe work, was built by the company itself under its own patents.

Concrete Mixers.—The Koehring Machine Company, Milwaukee, Wis., has appointed John A. Donahue, Great Northern Building, Chicago, Ill., as selling agent there for its line of products.

Cranes.—The Case Crane Company, Columbus, O., has been reorganized, with a nominal capital of $10,000, and will take over the present Case Crane Company with shops on Curtiss avenue. It will build electric hand power cranes, hoists, grab bucket machinery, derricks, etc. E. K. Stewart is president; S. S. Waite, vice-president; H. T. Stewart, secretary, and J. H. Roys, treasurer.

Concrete Mixers.—The Milwaukee Concrete Mixer & Machinery Company, W. J. Rosebery, manager, which was organized last winter, now has some of its machines out in operation, with very satisfactory results. This concern expects to be a large buyer of material, including steam and gasoline engines, motors, clutches, &c., the furnishing of some of which is already covered by contracts.

Fire Engine Test.—There has been much comment in the city of Seattle, Wash., and some dispute as to the records made by the two-third size Universal fire engines recently tested in the city of Seattle by Master Mechanic Sherwood, of the department, and Mr. King, also of the department. The records as made by these engines were so phenomenal that there were many in the department who disputed the same. The records were published in the fire journals, and at that time the test was with two lines of hose, 100 ft. in each line siamesed into 1¾-in. smooth-bore nozzle, with 25-lb. water pressure on the hydrant. These little third size Universal engines delivered 749 gallons of water per minute for 20 minutes' run. It created so much excitement in the department that Chief Boyle—after taking the position of Chief—ordered the engines out for another test, and this time they took the engines to the wharf, drafting salt water 9½ ft., with two 100-ft. lines of hose with 1⅛-in. smooth-bore nozzle on each line, and the engines maintained an average water pressure at the nozzles of 75 lb., which shows delivering capacity of 644 gallons per minute. The 1⅛-in. nozzles were taken off and supplanted with the 1¼-in. nozzles, one on each line, and under this test the engine showed a delivering capacity of 718 gallons of water per minute which showed a nozzle pressure of 60 lb. on each line—running at very high speed—and during the entire run all the bearings were in perfect condition. These statements can be verified by writing to Chief Boyle, of the Fire Department at Seattle, or Master Mechanic Sherwood, of Seattle Fire Department.

Sewer Pipe.—The Standard Sewer Pipe Company, Rome, Ga., has purchased a large tract of clay land near Rome and is preparing to operate on an extensive scale. The rapid municipal development in the South is expected to affect a wide local field. Small municipalities, even of 500 inhabitants, are now putting in sewers. The company is under the management of D. B. Hamilton, Jr., president, and Charles C. Harper, secretary and treasurer.

New Well Pump.—The Humphreys Manufacturing Co., Mansfield, O., is making an electrically driven screw pump for use in wells, two sizes, 8 and 12 in. in diameter being manufactured. The pump consists of two helices or screws which mesh together and force the water upward in a continuous stream. The screws are driven by gears actuated by a shaft rising through the well to a headstock to which the motor is connected.

Metal Culverts and Tanks.—A plant for the manufacture of metal culverts, roofing, siding, tanks and corrugated iron products of various kinds is to be erected at Shawnee, Okla., by Belt & Walters. The necessary machinery is said to have been ordered. This industry was secured through the efforts of the local Chamber of Commerce.

Canal Lock Machinery.—Contract for furnishing and installing equipment for operating and lighting eight of the locks on the Erie, Oswego and Champlain canals has been awarded to the D'Olier Engineering Company, of Philadelphia, by the Commissioners of Public Works of the State of New York. The amount of the contract is $178,000. The contract includes reinforced concrete buildings, generators, switchboards, seventy electric motors, eight water wheels with governors, head gates, etc., valve operating machinery, traveling cranes, ten electric capstans, lead covered rubber insulated electric mains and other material.

MUNICIPAL APPLIANCES

Under-Mounted Traction Engine

Traction engines may be divided into two classes, top-mounted and under-mounted, each having an advantage in the particular kind of work to be done, belt work or traction work. These two kinds of work require that the power be delivered at two different points on the engine, flywheel and drawbar. The demands on an engine when delivering traction power at the drawbar are entirely different from those when delivering belt power at the flywheel. These facts were all taken into consideration by the Avery Company, and, realizing the widely different and far greater demands on an engine which was to be used for heavy traction work than on one which was to be used largely for furnishing belt power, the Avery Company instead of building over their top-mounted engine by using a heavier construction, designed and built an engine especially for heavy traction work with an entirely different construction—being under-mounted instead of top-mounted.

The boiler is of the direct flue, locomotive type. Has ½-inch flue sheets, with ⅜-inch flanged plates and 5-16-inch shell on the 18, 20, 22 and 30-horsepower sizes, and ½-inch flanged plates and ½-inch shell on the 40-horsepower. It is well equipped with hand-hole plates and made easy to clean out. The 18-horsepower boiler has fifty-four 2-inch flues, the 20-horsepower forty-one 2½-inch flues, the 22-horsepower sixty-six 2-inch flues, the 30-horsepower forty-eight 2½-inch flues, and the 40-horsepower forty-five 2½-inch flues. The method used for bracing and staying all flat surfaces on the boiler and dry pipe is substantial. The boiler heads have T-bar, crow-foot and fore and aft stays. The boiler has an extra low water line, which gives a large steam space and insures an ample amount of dry steam at all times, while at the same time an abundant supply of water may be carried above the flue and crown sheet line, which is an especially important feature in a traction engine that must travel over rough roads and on side hills. The smoke-stack is cast and will not burn or rust out.

The steampipe starts in the dome, goes down to just above the water line and then forward through the front boiler head and down to the cylinders through the bottom of the smoke box. It will thus drain in freezing weather and the steam is superheated. On the end of the steampipe inside the dome is placed a throttle valve of the superior locomotive, double-seated poppet type, ground in, and opening and closing in a perpendicular line of movement, without wear or friction, and nearly balanced by the steam pressure. The dome top is removable, so that the valve can be gotten at without difficulty. Its construction, however, is such that it requires no oiling, is practically indestructible and impossible to get out of order. The use of this internal valve prevents the condensation of the steam, caused by the exposure of the steampipe to the air.

The valve gear is of the Springer curved block style. There are but few wearing points and these are supplied with take-up provisions. The balance valve is seated with steam taken from the cylinder, and the semi-circular cover with the rings protects the valve against the boiler pressure in the steam chest. This type of valve is claimed not only to increase the power of the engine, but also to reduce the amount of fuel, water and lubricating oil required.

The gravity gear oiler furnished regularly has a large oil capacity and the valves to the head pipes can be opened and closed from the engineer's platform. The style of rear axle is a solid steel shaft, reinforced in the center by a heavy cast iron mold. All pinions used in Avery engines are steel and the entire balance of the gearing is semi-steel.

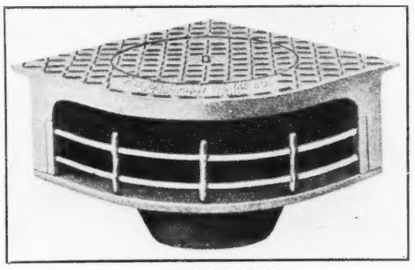
The crank-shaft is one solid piece of forged steel, very heavy. The double engine crank-shaft not only possesses great strength in itself, but the manner of mounting adds to its power of resisting strains. It is supported by four heavy boxings, the two inside bearings being 3¼ inches in width on all engines, and the two outer bearings 8¼ inches in width. The crank-shaft counterweights give a perfect balance and are securely attached. A double speed gear is provided, one speed for heavy hauling, the other for pulling lighter loads. The gearing is covered with special cast gear shields. Rear wheels are 20-inch face and 65 inches high on 18-horsepower engines, 26-inch face and 67 inches high on 20 and 22-horsepower engines, 26-inch face and 80 inches high on 30 and 40-horsepower engines. Front wheels are 10-inch face and 46 inches high on 18-horsepower engines, 12-inch face and 46 inches high on 20 and 22-horsepower engines, 12-inch face and 52 inches high on 30 and 40-horsepower engines.

In the steering mechanism a screw shaft takes the place of chains. Turning the steering wheel revolves the gears and turns the screw shaft, which shifts the guide either to the right or the left. A steam steering device may be supplied which consists of a double-cylinder engine geared to the steering worm shaft.

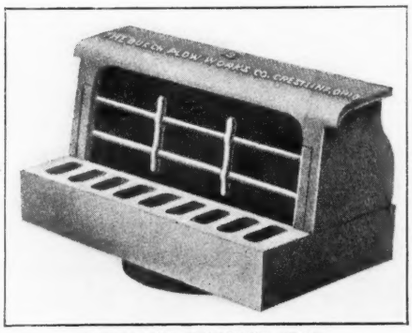
The Avery Company also makes a single cylinder return flue traction engine in the following sizes: 16, 20, 25 and 30 horsepower. It is suitable for belt work and ordinary traction purposes. There are some differences in detail of construction of each size.

Sewer Inlets

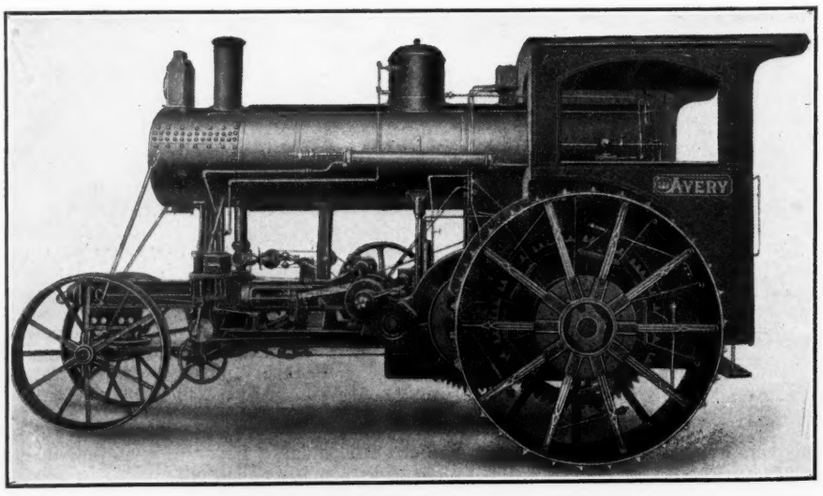
Sewer inlets of many varieties for every sort of location and service are made by the Burch Plow Works Co., Crestline, O. Burch sewer inlet No. 500 is of a pattern that has been in use in all parts of the United States for several years. Where corner inlets are preferred in connection with ordinary straight curb, this pattern is desirable on account of size of waterway, durability and neat, compact appearance. It has a removable wrought-iron grate, supplied with horizontal and vertical bars, and various sized outlets, as per order, which connect directly with sewer pipe. When set on a level wall the top plate of inlet has proper rise of sidewalk and is at right angles with the curb. The heavy 18-inch lid insures safety from accident and affords facilities for examining pipe connection. Burch sewer inlet No. 507 has a rounded upper corner on face, and for 1½-inch pitch curb. It is made for direct connection with sewer pipe, or to set over wells or basins. It is furnished with removable top if required. This inlet is neat in appearance and does not obstruct the walls.



CORNER INLET



INLET FOR STRAIGHT CURB



AVERY UNDERMOUNTED TRACTION ENGINE

Quick Detachable Demountable Rim

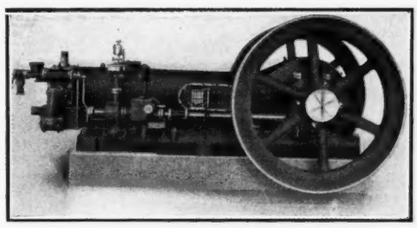
ONE of the more recent improvements in demountable rims is the safety locking ring (in grove at extreme right of cut) that forms a part of the Firestone quick detachable rim with which Firestone demountable rims are equipped. This locking ring is so shaped that it prevents the rim from coming apart and releasing the tire, no matter how severe the strain. Such accidents can all be traced to the locking ring turning over in its groove and allowing the clincher side ring to work over and off the wheel, or else to the clincher side ring not being properly supported and breaking where flaws occur in the metal. As illustrated herewith, the Firestone locking ring has a bearing not only on the under side of the clincher side ring, but also on the outside edge of the base of the rim. It will be seen at a glance that the locking ring is held immovably and cannot turn over in its groove. The projection of the locking ring to an unusual height brings a strong support to the back of the clincher side ring. The pins on the

LOCKING RING FOR DEMOUNTABLE TIRE

locking ring engage the slots in the clincher side ring, forming a guide that insures proper seating of the locking ring in its groove. They also prevent circumferential motion. The device is manufactured by the Firestone Tire & Rubber Company Akron, O.

Air Compressor and Gas Engine

AN air compressor and gas engine which is designed to meet a demand for a gas engine or an air compressing outfit that is self-contained, economical and durable, as well as simple in construction and easy to manipulate, is manufactured by the Flickinger Iron Works, Bradford, Pa. The bed plates, of gray iron, are substantial and neat in appearance. The cylinders are cast in one piece with liberal thickness of metal and are water-jacketed the entire length with ample means for cleaning. The cylinder heads are also water-jacketed and are all easily removed for access to the cylinders and jackets for cleaning, as there are no pipe connections to cylinder heads except a small pipe for air starter. The main bearings are provided with interchangeable bronze liners. They are cored out to receive a large quantity of waste to filter the oil before it reaches the journals. A constant stream of oil, in plain sight of the engineer, runs through these filters, automatically stopping and starting with the engine. Crank-shafts are of the center crank type, made of open hearth steel, forged from solid steel billets. Connecting rods are made of open hearth steel, provided with screw and wedge take-



AIR COMPRESSOR WITH GAS ENGINE

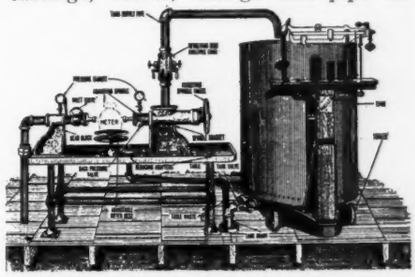
up on cross-head end with solid bronze boxes, and the crank end is of the marine type with steel boxes lined with hard genuine Babbitt metal. Bolts are made of chrome nickel steel with ample means for adjustment. Cross-heads are of special design, being adjustable at both top and bottom. Valves on the gas engines are of the mushroom type, all of them vertical and submerged in oil. The inlet valves are operated by vacuum, and are provided with dash pots to insure their smooth working and easy sealing. The discharge valves of the air compressor are of the standard poppet type, made with guides which can be removed without breaking any pipe connections. The intake valves are of the coreless type and are mechanically operated. They are different from other compressor valves in that they are at rest during the entire compression stroke, thereby insuring long life and smooth running. The lay shafts are driven by spiral gears cut from solid steel, the bearings being run in a bath of oil. Governors are of the vertical ball type, driven by spiral gears from the lay shafts, and these gears are run in oil. The governor operates throttling valves, one of which is provided for each cylinder. The ignition used is the Goodson system, the jump spark system or make and break, as the requirements demand. The exhaust pipes are muffled.

Trench Excavator

THE Hovland tile ditcher was designed and perfected for ditching and tilling wet farm land, but is suitable for ditch digging or other purposes. The machinery is mounted on two cars, one for the power equipment, the other for the excavator, both propelled by caterpillar traction. The length of the traction car is 22 feet, its width 10 feet. The ditcher is 26 feet long and 10 feet wide. The diameter of the main digging shaft is 4 7-16 inches. The engine crank-shaft is 3½ inches. The shipping weight of the single-wheel outfit, 45-horsepower engine, is 34,000 pounds; the double-wheel outfit, with 60-horsepower engine, 44,000 pounds. All working parts are protected from grit. In operation a steel-lined curbing follows the cutter closely, insuring a clean ditch to receive the pipe. The digging chain is so constructed that the braces stretch the chain when reamer or shovel comes in contact with stones. This principle saves breaking the diggers, and is controlled by varying the tightness of the digging chain. An automatic cleaning device cleans each shovel and reamer every time it passes over the sprocket and reamer. The capacity of the machine is from 40 to 150 feet per hour for trenches varying from 6 to 12 feet in depth and from 10 to 30 inches wide. The Hovland tile ditcher is manufactured by the St. Paul Ditcher and Carrier Company, St. Paul, Minn.

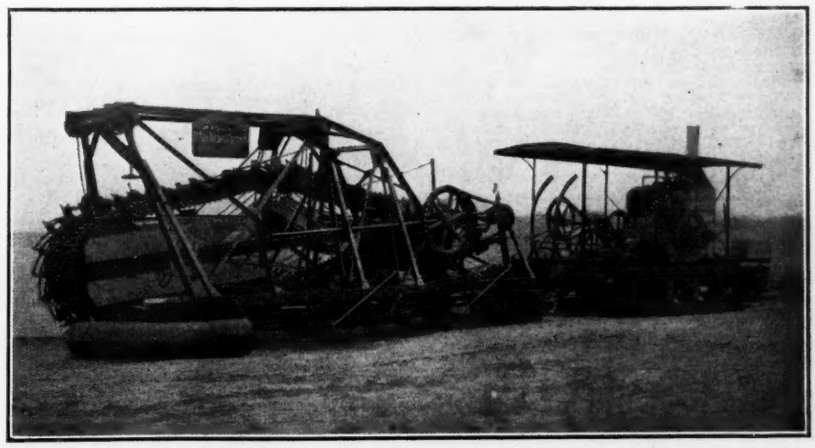
Water Meter Tester

THE Mueller water meter tester has been entirely remodeled, and is now a very convenient and accurate device for the purpose of testing water meters. One of the material improvements is the replacing of the old-style multiple cock within a new-style revolving disc multiple cock that cannot wedge or stick. The tester consists of special castings, valves, fittings and pipe so



WATER METER TESTING DEVICE

arranged that a meter can be quickly placed in position without the use of tools. The water is turned on and off with throttle valves, which are easily and quickly operated. The scale is specially constructed and enables the per cent of error to be determined by little more than a glance. The tank and table are specially constructed for this purpose. The tester is made by the H. Mueller Manufacturing Company. Eastern office, 254 Canal street, New York City.



DITCH DIGGING MACHINE WITH CATERPILLAR TRACTION

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

STREET IMPROVEMENTS

Eufaula, Ala.—City will expend $4,000 in working roads in this section.

Gadsden, Ala.—Council has passed ordinance for treating Forest ave. with asphalt preparation to lay dust.

Greenville, Ala.—Butler County is considering bond issue for road construction.

Huntsville, Ala.—Council has inspected sidewalks with view to improvements.

Pasadena, Cal.—Council is considering improvement of nine streets.

Red Bluff, Cal.—Tehama County will vote on $30,000 road bonds instead of $60,000, as first proposed.

Sacramento, Cal.—Trustees have directed that U st. be improved with oiled macadam.

San Francisco, Cal.—Cost of improving Berry st. has been estimated at $42,000.

San Francisco, Cal.—Cost of constructing granite curbs and asphalt pavement on concrete foundation on 19th st. has been estimated at $200,000, or if asphalt macadam is substituted, $150,000; cost of constructing granite curbs and asphalt pavement on concrete foundation of number of streets, $750,000; if asphalt macadam is used, $475,000.

San Francisco, Cal.—Paving of Lincoln Way at cost of $15,000 is being considered.

Fort Morgan, Col.—County Commissioners will accept proposition of the State Highway Commission to pay portion of expense of building automobile road between this city and Denver; cost about $14,000.

Grand Junction, Col.—County Commissioners are considering construction of road from Palisade to Hannah Creek.

Leadville, Col.—Committee of the Whole is considering purchase of steam roller for street purposes.

New Britain, Conn.—City is considering construction of approximately 24,000 sq. yds. of pavement on concrete foundation; 5-in. bluestone curb and gutter will be laid.—Francis H. Oldershaw, City Engineer.

Wilmington, Del.—Board of Street and Sewer Directors has decided to widen Broome st.

Miami, Fla.—Dade County has sold $150,000 road and funding bonds to C. L. Bagwell & Co., Jacksonville.

St. Augustine, Fla.—Council has decided to pave S. St. George st. with shell.

Atlanta, Ga.—Extension of Georgia ave. to west end is being considered.

Macon, Ga.—Bibb County will issue $500,000 bonds for building roads and bridges and for other improvements.

Decatur, Ill.—Paving of Jasper st. is being considered.

Detroit, Ill.—Town has voted $1,000 bonds to build sidewalks.

Freeport, Ill.—City will pave Adams and Williams sts. at estimated cost of $39,000.

Milton, Ill.—Town has voted $1,000 bonds to guild granitoid sidewalks; $1,200 available.

Watseka, Ill.—Plans have been prepared for the construction of 45,000 sq. yds. of macadam and tarvia pavement on a stone foundation; concrete curb and gutter will be laid.—G. C. Houston, Engineer.

Indianapolis, Ind.—Plans are being prepared for 82 street improvements; petitions for about 75 improvements are being considered.

Ft. Dodge, Ia.—City will pave 18 blocks with 5-in. Portland cement, concrete base, and 2-in. wearing surface; bids will be asked after May 16; Council is considering paving and curbing of portions of four streets.—W. L. Taug, City Clerk.

Manchester, Ia.—City will make trial test of cement pavement this spring, and if successful several blocks of paving will be laid; committee has been appointed to investigate cement paving at Mason City.
vestigate cement paving at Mason City.—Chas. Hhruby, City Clerk.

Red Oak, Ia.—Council will consider resolution of necessity for 36,000 yds. of bitumenized macadam and 10,000 ft. of concrete curb May 16. Addresses of vendors of manhole covers and other municipal castings desired.—Theo. S. Delay, Creston, Engineer in Charge.

Waterloo, Ia.—Grading, curbing and paving of Baltimore st. is being considered.—R. A. Doty, Mayor.

Fort Scott, Kan.—Bids will at once be asked for paving Hill st.

Hutchinson, Kan.—City Board is considering curbing of Main st.; distance one-half mile.

Independence, Kan.—Bids will be advertised for paving W. 11th and two other streets; length, 22 blocks.

Leavenworth, Kan.—Council has passed ordinances to regrade and pave 10 streets.

Cyntniana, Ky.—Street Committee will advertise for bids for 8,000 gals. of oil.—M. C. Swiftford, Mayor.

Louisville, Ky.—Board of Public Works will open bids soon for laying about $12,000 worth of vit. paving in various alleys.

Louisville, Ky.—Park Board will construct short road at cost of $4,000.

Monroe, La.—Ouachita County has voted tax for improvement of roads.

New Orleans, La.—Council will consider paving of Bourbon st. with natural bituminous limerock asphalt.

Portland, Me.—Department of Public Works will at once improve portions of 21 streets.—Bion Bradbury, Jr., Commissioner.

Denton, Md.—Caroline County Commissioners are considering construction of road from Denton into Tuckahoe Neck and to Willow Pond; distance about two miles.

Bradford, Mass.—Town has appropriated $6,000 for highways.—T. Morrison, Town Clerk.

Lowell, Mass.—Cost of macadamizing streets has been estimated as follows: Stevens st., $5,000; Smith st., $5,600; part of Smith st., $3,500; Ennel st., $4,000; Victor st., $950; Butler ave., $1,000; top dressing Common st., $1,000; top dressing Common ave., $1,100, and paving Elm st. with old blocks, $5,500.

Lynn, Mass.—Board of Public Works has asked for bids for construction work on extension of Allen ave.

Taunton, Mass.—Committee on Streets and Bridges is investigating tarvia and oil binders for macadam roads; widening of Caswell st. is being considered.

Caro, Mich.—Township Board of Indianfields will build another mile of "Class B" state reward gravel road.

Biwabik, Minn.—St. Louis County is considering construction of better roads.

Duluth, Minn.—Cost of paving Greysohn rd. with crushed rock macadam is estimated at $2,786.96; with combined cement curb and gutter, $3,374.30; Garfield ave. viaduct will be repaired at cost of $2,000.

Lindford, Minn.—Township will receive bids May 7 for $6,500 road and bridge bonds.—J. W. Skifstrom, Town Clerk.

Two Harbors, Minn.—Plans and specifications have been prepared for grading and macadamizing Poplar and Cedar sts.

Yazoo City, Miss.—Board of County Commissioners is considering construction of public road from Shelley's to Vicksburg road.

Kansas City, Mo.—Board of Public Works has adopted resolution for grading nine streets; artificial stone curbing, two streets; artificial stone sidewalks, seven streets; asphalt pavements, seven streets; brick or brick block pavement, three alleys; concrete pavement, one alley; macadam pavement, Oak st., and stone block pavement on Independence st.

Springfield, Mo.—Council has ordered the construction of sidewalks on Minor st.

Libby, Mont.—Council has taken first steps in work of creating special improvement district for construction of sidewalks throughout town.

Bloomfield, N. J.—Council has adopted ordinance for laying out, opening, widening and straightening of Crown st. and Roosevelt ave.

Cape May, N. J.—Cape May County Freeholders are securing right of way for widening Ocean City turnpike 20 ft.

Clinton, N. J.—Hunterdon County Board of Freeholders has ordered road from Annandale to Clinton surveyed preparatory to macadamizing.

East Orange, N. J.—Road Committee of Council will arrange to have some of the seven miles of new streets to be built this year paved with bitulithic block at cost between $2 and $2.50 a sq. yd.

Monmouth Beach, N. J.—Improving of Riverdale ave. is being considered.

Paterson, N. J.—Board of Freeholders will expend $29,000 on repair of roads in this city; $18,000 will be spent in spreading oil on numerous country roads.

Paulsboro, N. J.—Citizens will vote June 7 on $6,000 bonds for improving Delaware st.

Ventnor, N. J.—Atlantic City and this city are considering improvement of Jackson ave.

Buffalo, N. Y.—County will secure right of way for boulevard from this city to Niagara Falls; road will be built by State.

Cooperstown, N. .Y.—Village Board has decided to lay 9,600 sq. ft. of cement walks.

Herkimer, N. Y.—Board of Trustees has approved plans for improvement of East Albany and Mohawk sts.

Mt. Vernon, N. Y.—Repaving of three streets is being considered.—Alderman Van Tassel, Chairman Streets and Sidewalks Committee.

Nyack, N. Y.—Village will receive bids for paving Franklin st.—H. E. Smith, 134 Main st., Clerk.

Winston-Salem, N. C.—Yodkin River Railroad Co. will soon construct proposed road from Donnana to East Bend.—Geo. Steelman, of Shore, President.

Bellaire, O.—Council has passed resolutions to improve Pine alley and Franklyn st.

Dayton, O.—Council is considering improvement of four more streets.

Mansfield, O.—Council has decided to improve W. 6th, Chestnut and Main sts.—K. P. Troll, Clerk.

Fostoria, O.—Citizens have voted $100,000 bonds for road improvements.

Steubenville, O.—Pike Commissioners of Bloomfield and Weston Pike have awarded $11,500 bonds to National Exchange Bank.

Toledo, O.—Service Director J. R. Cowell has invited bids from contractors outside of city for contracts for building sidewalks during coming year; $80,000 will be expended.

Altus, Okla.—City will construct five miles of paving as soon as water and sewer mains are laid.

Henryetta, Okla.—City will at once construct 30,000 ft. of concrete sidewalks.

Oklahoma City, Okla.—City has not as yet received bids on $450,000 paving contracts which include paving of Linwood blvd.

Junction City, Ore.—City has called for bids for improving streets bordering on some 50 blocks, to grade, gravel and establish curb lines.—D. E. Ruff, Recorder.

The Dalles, Ore.—Paving 3d st. with bitulithic, to Warren Construction Co., Oregonian Bldg., Portland, $1.90 per sq. yd.

Salem, Ore.—County Court is considering construction of road from Mt. Angel to Gervais.

Butler, Pa.—Council has adopted ordinances for paving Jackson and 3d sts.

Chester, Pa.—Edgmont ave. business men are urging sewering and paving of that thoroughfare.

Dunmore, Pa.—Borough Engineer will prepare plan for paving E. Drinker st.

Erie, Pa.—Messrs. Hess & Gross have been selected by Council to report concerning construction of municipal asphalt plant.

Erie, Pa.—Council has rejected bids for paving W. 7th st. as too high; Mayer Bros., lowest bidders, asphalt, $1.48 per sq. yd.; John McCormick & Son, brick, $1.47.

Erie, Pa.—Buffalo and Lake Erie Traction Co. will relay pavements between all tracks in city.

Harrisburg, Pa.—Council is considering one paving ordinance and seven other measures providing for grass plots, change of curb lines and width of streets.

Johnstown, Pa.—Highway Committee is considering grading and paving five streets and one alley.

Johnstown, Pa.—Council is considering paving and improving portions of 23 streets and alleys.

Morrisville, Pa.—Borough will expend $10,000 this year for streets.

Phœnixville, Pa.—Borough Council is

considering paving entire length of Bridge st.; total cost $13,966.26.

Reading, Pa.—Chairman John H. Keppelman and George F. Baer, President of the Reading Railway, will devise plan to abolish dangerous grade crossings on Penn st.

Reading, Pa.—Road Supervisors of Washington Township, Berks County, will oil four miles of recently built State roads, leading from Bally to Barto and Schultzville.

Susquehanna, Pa.—Paving of Main st. with brick is being urged.

York, Pa.—Citizens have petitioned for paving of South Hartley and North Queen sts.

Wakefield, R. I.—Oiling of Main st. next summer is being considered.

Chattanooga, Tenn.—Council has passed ordinance providing for $100,000 bond issue for street paving in Highland Park.

Hickman, Tenn.—Fulton County will construct gravel roads.

Knoxville, Tenn.—Contract for improving several streets will be awarded at once.

Alice, Tex.—Citizens have voted $5,000 bonds for street improvements.

Batesville, Tex.—Citizens have voted $20,000 road and bridge bonds.

Dallas, Tex.—Bids will be advertised for improving Commerce st. from plans by City Engineer.

Dallas, Tex.—Bids will be received at once for paving Elm st. with brick, bitulithic or bois d'arc blocks; bids have been advertised for grading Fitzhugh ave.

Fort Worth, Tex.—City Commission has favorably acted upon petitions asking for paving of 80,000 sq. yds. on various streets; cost about $60,000.

Martindale, Tex.—Road District No. 2 of Caldwell County will vote May 21 on $25,000 bonds for road construction.

Palestine, Tex.—City is considering paving of residence streets.

San Angelo, Tex.—Mayor J. D. Hassell has recommended paving of business section, establishment of grade line and construction of sidewalks in residence section.

Sherman, Tex.—Bids will be opened early in May for necessary paving brick.—J. C. Wall, Mayor.

Provo, Utah.—Provo-Olmsted Boulevard Committee, which has charge of building drive from Provo to Olmsted, has decided to complete road this summer; James L. Meldrum will supervise work; cost about $20,000.

Tooele, Utah.—Council is considering bonds for street improvements.

Portsmouth, Va.—Mayor Reed is urging immediate issuance of bonds for street improvements.

Pulaski, Va.—No bids were received for proposed $70,000 road bond issue.

Olympia, Wash.—Council has decided to expend $177,000 in street improvements.

Spokane, Wash.—Grading, parking and curbing of Cœur D'Alene st. is being considered.

Spokane, Wash.—Paving of Hill ave. and improvement of Southeast Boulevard are being urged.

Tacoma, Wash.—City Engineer W. C. Raleigh is planning asphalt boulevard to connect South Tacoma with city; cost about $300,000.

Walla Walla, Wash.—Council has ordered survey of that part of proposed road to penitentiary that is within city limits.

Elmgrove, W. Va.—Paving of National road from this place to Trudelphia is being urged.

Huntington, W. Va.—Bids are now being asked for grading, curbing and paving Maple ave.

Williamson, W. Va.—Citizens have voted bonds for street paving.

Sheboygan, Wis.—Council has passed big street paving ordinance whereby sections of four streets on south and west sides will be paved with brick and parts of six streets macadamized.

Huntsville, Ont., Can.—Citizens have voted $12,000 bonds for street improvements.

Moose Jaw, Sask., Can.—Citizens have voted by-law to raise $140,000 for construction of pavements and widening of existing sidewalks.

Westmount, Que., Can.—Ratepayers have approved $550,000 expenditure for sidewalk, roadway and other improvements.

CONTRACTS AWARDED

Attalla, Ala.—Construction of certain sidewalks and combined curb and gutter on 4th and 5th sts. and 5th ave., to Morris & Angel, Sheffield, $8,859.50; quantities and prices as follows: 5,100 sq. yds. artificial stone sidewalk, $0.945; 100 sq. yds. artificial stone driveway, $1.40; 7,800 lin. ft. artificial stone combined curb and gutter, 50c.; total cost, $8,859.50.—Hill & Campbell, Gadsden, Engineers.

Berkeley, Cal.—Cement walks, 500,000 ft., for Mason-McDuffie Co., to M. S. Foss and P. Seinmoor, about $50,000.

Pasadena, Cal.—Grading, oiling, curbing and sidewalking Michigán ave., to J. E. Haddock, $3,410.05.

Atlanta, Ga.—Brick paving, to G. W. Lane Co., city; wood and granite blocks, to Lasley Co.

Brunswick, Ga.—Street paving, two blocks, to Chattanooga Paving and Construction Co., $1,55 per sq. yd.

Bloomington, Ill.—Brick pavement, 15,000 sq. yds., on Madison and Jefferson sts., to I. D. Lain, city; stone curb, 46½c. per lin. ft.; Danville vit. brick, $1.73 and $1.69 per sq. yd.; c.-i. sewer inlets, each, $10, and 12-in. vit. sewer, 40c.

Chicago, Ill.—Paving with brick a portion of S. Washington st., to A. D. Thompson, Peoria, $102,000.

Pekin, Ill.—Paving Buena Vista ave., to Jansen & Zoeller, city, $6,251.

Delphi, Ind.—Gravel road, Carroll County, to J. C. O'Connor, $3,595, $5,373 and $5,642, respectively.

East Connersville, Ind.—Cement sidewalks, 92,500 sq. ft., to Boots & Gaut, Greenfield, 7.91c. on 4-in. gravel foundation; Stevens Construction Co., Chicago, 8½c.; Hostes & Raiser, Union City, 8.34c.; Miller Bros., city, 8.4c.; Greenwood & Conner, 8.44c.; Harmon Bros., Lee & Everroad, Columbus, Ind., 8.47c.; Chas. Williams, Jr., city, 8½c.; Paul Carlos, city, 8.58c.; A. T. Seaman, Elgin, Ill., 8.85c.; Jos. Hall, Logansport, Ind., 8⅞c.; Payne & Thomas, 8.97c.; A. J. Lines, city, 9¾c. and Jas. H. Davis, Portland, Ind., 10c.—K. L. Hanson, Engineer

Marion, Ind.—Gravel road, to Mackey & Druckemiller, local contractors, $6,135.50.

South Bend, Ind.—Paving Prairie ave., to H. N. Barnes.

Williamsport, Ind.—Construction of 15,817 ft. of gravel road in Jordan Township, to Conover & Taber, $12,545.

Grinnell, Ia.—Alley paving, to Wm. Horrabin, Iowa City, as follows: Brick paving, $1.93 per sq. yd.; grading, 36c. per cu. yd., and curbing, 40c. per lin. ft.

Independence, Kan.—Paving streets, to Hipple & McSpadden, Vinita, Okla., $45,491.93.

Wichita, Kan.—Paving S. Lawrence ave., to Kansas Bitulithic Paving Co., $2.15 per sq. yd. for bitulithic.

Houma, La.—Paving Main st., to Garber & Maltby.

Sharptown, Md.—Slate road from this city to Riverton, to Caroline Construction Co., Preston.

Everett, Mass.—Granite block paving, to Simpson Bros. Corporation, Boston, $1.48 less 1 per cent ten days; Pigeon Hill Granite Co., $1.47; Hildreth Granite Co., $1.55; vit. brick, J. W. Hahn, Boston, Johnsonburg, $29.50, less 6 per cent; Shawmut Brick Co., $27.50, less 2 per cent; Bessemer block, $29, less 1 per cent; award not made yet; curbing, to S. & R. J. Lombard, Charlestown, straight 59c., circle 76c., corners $2.50.

Lowell, Mass.—Paving block, 15,000 sq. yds., to Frank Malory, $1.24¾c. per yd.

Lowell, Mass.—Cement, 2,800 bbls., to D. F. Sullivan; circle stone, 200 ft., to F. A. Mallory.

Chisholm, Minn.—Laying cement walks, to Winslow & Cummings, $16,844.50.

Duluth, Minn.—Wooden walks for year, to W. H. Kilton; cement walks on Park Point, to Thomson & Stewart.

Maben, Miss.—Paving, 4,800 sq. ft., to Columbus Gravel and Concrete Co., Columbus, Miss.—Geo. W. Cooke, Mayor.

Vicksburg, Miss.—Paving, 8-in. asphalt, 32,870 sq. yds. to Southern Paving Co., excavation, 25,000 cu. yds., Barber Asphalt Co., $83,915.35; Southern Bitulithic Co., $90,380.65; Southern Paving and Construction Co., brick, $87,362.45; asphalt, $82,391.50; Hot Springs Construction Co., wood block, $99,405.76; brick, $85,929.06; Dunn & Laallande Bros., wood block, $105,429.08; brick, $89,024.08; Stevens Construction Co., asphalt, $88,603.95; brick, $90,484.85; asphaltic concrete, $79,099.45; resetting 14,641 lin. ft. of old and setting 14,641 lin. ft. of new curbing, to same firm; Barber, $8,638.19; Southern, $6,488.45; Southern Paving, brick, $8,784.60; Hot Springs Co., $8,564.98; Dunne Co., $8,491.78; Stevens Co., $9,516.65; curbing is figured in total bid also.

Chillicothe, Mo.—Granitoid sidewalks, third sidewalk district, to Robt. Barnett, $1.26 per sq. yd.

Atlantic City, N. J.—Reconstruction and strengthening Boardwalk between Illinois and South Carolina aves., to Nelson-Merydith Co., $6,211; other bidders were United Paving Co., Gilbert Paving and Construction Co. and Edward L. Bader.

Asbury Park, N. J.—Resurfacing stone road on Norwood ave. with bituminous paving requiring 9,975 sq. yds.; also regrading and surfacing shoulders of said road, requiring 9,350 sq. yds. bituminous pavement, to Delaware River Quarry and Construction Co., Trenton.

Long Branch, N. J.—Asphalt repairs, Barber Asphalt Co., $1.18 per sq. yd.; Delaware River Quarry and Construction Co., $1.45 per sq. yd.

Mount Holly, N. J.—Laying stone road, to A. M. Mathis, New Gretna, 52c. per cu. yd.; mattressing Chestnut Neck rd., to same bidder, $2,275.

New Brunswick, N. J.—Supplying stone, to Delaware R. Q. & C. Co., Woodbridge to Metuchen rd., $1.55 per ton delivered on the road; Iselin to Oak Tree, $1.50; East Rahway to county line, $1.20 on car; New Brunswick to Three Mile Run, $1.55 on road; Livingston ave., Hale street, $1.40; Monmouth Junction to Kingston, $1.65; Monmouth Junction to Dayton, $1.65; New Brunswick to Dayton, $1.75; Dayton to Jamesburg, $1.72; Dayton to Cranbury, $1.75; Cranbury to Cranbury Station, $1.75; Cranbury Neck to new county line, $1.75; Jamesburg to Englishtown, $1.85; Spotswood to Old Bridge, $1.75; South River to South Amboy, $1.65; Stelton to Metuchen, $1.50; Landbridge road to New Market, $1.55; Metuchen to Menlo Park, $1.50. To Thomas F. Dunigan, Woodbridge to Perth Amboy, $1.45; Woodbridge to Iselin, $1.45; Menlo Park to Rahway, $1.60; Cheesequake to Matawan, $1.65. To Herman Brothers, Metuchen to Perth Amboy, delivered on cars, $1.28 per ton. To F. R. Upton, Dunellen to Bound Brook, $1.23 delivered on road; Bound Brook to Highland Park, $1.45; Stelton to New Market, $1.50. To J. Y. Wilson, Plainfield to Park ave., $1.60; Maple ave., Plainfield, to South Plainfield, $1.40. To Abraham Jelin, George st., Hamilton st. to Land bridge, $1.50; New Brunswick to Old Bridge, $1.70.

Rochester, N. Y.—Depew st., cement walks, to Henry Scheenfeld, $519.50; Julia st., brick pavement, to Louis D'Argento, $2,946; Grove st., cement walks, to Henry Scheenfeld, $447; Whalen st., brick pavement, to Louis D'Argento, $3,683; Wangman st., brick pavement, to H. N. Cowles, $2,212; Lux st., sewer, cement walks and curbs, to W. H. Sours, 2d, $3,514; Orleans st., brick pavement, to Brayer & Albaugh, $2,005; Girard st., asphalt pavement, to F. C. Lauer & Sons, $2,756.50; Jennings st., sewer, to William Baker, $305; Kislingbury st., asphalt pavement, to F. C. Lauer & Sons, $11,193; Bryan st., asphalt pavement, to F. C. Lauer & Sons, $11,204; Selye terrace, asphalt pavement, to F. C. Lauer & Sons, $11,313.

Schenectady, N. Y.—Paving Linden st., to Schenectady Paving Co.

Raleigh, N. C.—Paving Fayetteville st., to Peters Bros. Paving Co., $1.70 per sq. yd.

East Liverpool, O.—Paving four streets, to John McLaughlin & Son, 10,814 sq. yds. brick, $1.00 1,041 cu. yds. clay and gravel excavation, 30c.; Freshwater Brothers, Chester, W. Va., $14,994.86; Rosser & Maloney, Bellaire, $15,587.12; Sand and Gravel Co., city, $14,105.66; Rinehart Bros., city, $15,251.26; J. C. Cunningham, city, $14,868.10; setting 3,580 lin. ft. concrete curbing, to same firm, 29c.—J. C. Kelly, City Engineer.

Hamilton, O.—Improvement of Rhea st., to J. H. Hiatt, $2,981.50.

Bucyrus, O.—Paving Middletown st., to J. W. Paule, Mansfield, $6,034.50; W. Rensselaer st., to Drake & Son, Marion, $5,032.40, and West alley, to Battefeld & McMichael, $7,648.

Enid, Okla.—Paving six streets, to Warner-Quinlan Asphalt Co., $2.03 and $2.04 per sq. yd.

Bradford, Pa.—Paving Central ave. with brick, to John Sheehan, city, 869 cu. yds. excavation, 50c.; 3,688 sq. yds. vit. brick paving, $2; 1,090 sq. yds. of special paving block, $2; 3,408 lin. ft. curb, 62c.; 75 ft. circular curb, 90c.; 75 ft. reset curb, 30c.; 1,000 ft. 4-in. tile, 12c.; 9 catch basins, each $45; 39 cu. yds. concrete, $7.50; 311 cu. yds. embankment, 75c., and gravel, $1.25; total $13,244. Totals of other bids: M. Applegate & Son, city, $13,525; Hurley & Lyne, Fredonia, N. Y., $13,783, and Eugene Peak, city, $14,317.

Bradford, Pa.—Sidewalks for one year, to J. Sheehan, 17c. per sq. ft.

Emporium, Pa.—Paving Broad st., to Costello & Nagel, Elmira, $7,900.

Scranton, Pa.—Paving, Washington ave., to Warren-Quinlan Co., $18,632.30; Jefferson ave., to Warner-Quinlan Co., $4,963.13; Monroe ave., to Warner-Quinlan Co., $5,419.11; Gibson st., to Warner-Quinlan Co.; Hitchcock Court, to Warner-Quinlan Co., $2,206.60.

Wilkes-Barre, Pa.—Paving several streets in Lee Park, Hanover Township, to H. G. Mulock Co., Atlantic City, N. J., $2.23 per sq. yd. for all streets except Oxford, which is to be $2.19.

York, Pa.—Relaying brick paving on W. Market st., for York Railways Co., to General Supply and Construction Co.

Aberdeen, S. D.—Creosoted block paving, to Flinn & Hanlon, Sioux City, Ia., $2.59.

Memphis, Tenn.—Paving portions of Wellington, Marshall and 7th sts., to H. P. Streicher & Co., St. Clair Bldg., $14,333.

Houston, Tex.—Construction of 33⅓ miles of roads, to Suderman-Dolson Co., $61,452 for construction of Western Air

Line road, 18 miles; to W. D. Haden, $10,725, La Porte and Seabrook road, 2½ miles; to W. S. Hipps, $32,960, Main st. road, 8 miles; to L. R. Davis, $18,720, Westheimer road, 4 miles.—John B. Ashe, County Auditor.

Salem, Va.—Improving portion of Red Hill road, to C. M. Boone, Roanoke

Chehalis, Wash.—Clearing and grubbing right of way for White road, to Wm. Young, Mossyrock, $3,240.

Everett, Wash.—Paving portions of Index road, to Olson & Mellem; Goldbar-Index road, to J. B. Harvey, $2,365.

Tacoma, Wash.—Paving Tacoma ave., to Barber Asphalt Co., $39,435; other bidders, Warter Bros., $41,250; N. A. Jones, $40,777; Coast Contracting Co., $42,488; Anderson Construction Co., $39,626; Independent Asphalt Paving Co., $41,795; Keasel Construction Co., $42,700.

Tacoma, Wash.—Roadway, 3,000 yds., to Bertelson & Sons, $7,343.

Spokane, Wash.—Pavement, 18 miles, to J. O. Hill, Chicago, about $575,000.

Two Rivers, Wis.—Macadam paving on 16th and Washington sts., to Walter Bohr, $12,000.

BIDS RECEIVED

Los Angeles, Cal.—Eight miles of highway work on Washington st., C. W. Brashear, lowest bidder; grading and culverts of one section, $3,379, and $12,869 for the other, and $1.69 a ton for laying rock; about 31,000 tons of rock will be required.

Macon, Ga.—Street paving, Georgia Engineering Co., granite block, 6-in. foundation, $2.08; 4-in., $2.57; 5-in., $2.63; brick, 6-in. foundation, $2.08; 4-in., $1.93; 5-in., $2; wooden blocks, 6-in., $2.65; 4-in., $2.53; 5-in., $2.58. W. J. Beeland, city, granite block, 6-in., $2.71; 4-in., $2.60; 5-in., $2.49; wooden blocks, 6-in., $2.97; 4-in., $2.75; 5-in., $2.86. Barker Asphalt Co., asphalt, 6-in., $1.86; 4-in., $1.65; 5-in., $1.97; bitulithic, 6-in., $1.10; 4-in., $1.08; 5-in., $1.77. Atlantic Bitulithic Co., Richmond, Va., bitulithic, 6-in., $2.32; 4-in., $2.12; 5-in., $2.20. C. W. Lane Co., Atlanta, granite block, 6-in. foundation, $2.32; 4-in., $2.17; 5-in., $2.24; brick, 6-in., $1.94; 4-in., $1.79; 5-in., $1.86; wooden blocks, 6-in., $2.38; 4-in., $2.23; 5-in., $2.30; brick, with pitch filler, 8c. per sq. yd. additional. Jamison & Hallowell, granite blocks, 6-in. foundation, $2.66; 4-in., $2.56; brick, 6-in., $2.23; 4-in., $2.05; 5-in., $2.12; wooden blocks, 6-in., $2.57; 4-in., $2.39; 5-in., $2.47; Hassam concrete, 6-in., $2.73; 4-in., $1.86. Hall-Parker Construction Co., brick, 6-in., $2.23; 4-in., $2.03; 5-in., $2.13; wooden blocks, 6-in., $2.51; 4-in., $2.31; 5-in., $2.41. McPoland & O'Gara, Birmingham, Ala., wooden block, 6-in. foundation, $2.49; 4-in., $2.28; 5-in., $2.38. Rudolph S. Blome Co., Chicago, granitoid, 5-in. foundation, $2.04. W. M. Lasley, Chattanooga, granite blocks, 6-in. foundation, $2.28; 4-in., $2.12; brick, 6-in., $2.08; 4-in., $1.95; 5-in., $1.99; wooden blocks,, 6-in., $2.29; 4-in., $2.12; 5-in., $2.21.

Chicago, Ill.—Asphalt paving, 82,000 sq. yds., American Asphalt Paving Co., lowest bidder.

Evansville, Ind.—Improvement of Iowa st., Western Construction Co., $1.96 per yd. for asphalt and 30c. per yd. for stone curbing; three other bidders on brick; Edgar st., Western Asphalt Co., asphalt, $1.96; Stinchfield & Reichert, brick, $1.80; Bedford & Nugent, Mack, block, $1.83.

New Bedford, Mass.—Sidewalks, granolithic, John Sykes & Co., 17 Highland st., 97½c.; Loftus & Dugan, 859 Rockdale ave., 99c.; Manuel Alves., 39 Dartmouth st., $1.13; John Sykes, 19 Collins st., $1.15; Pawtucket Granolithic Construction Co., 29 Hathaway st., $1.20; Simpson Bros. Corporation, 166 Devonshire st., Boston, Mass., $1.24; E. R. Taylor Co., Boston, Mass., $1.24½.

New Bedford, Mass.—Furnish granite paving blocks, John B. Sullivan & Son, $1.50 per sq. yd.; Simpson Bros. Corporation, Boston, $1.69 per sq. yd.; Smith Granite Co., Westerly, R. I., $1.37 per sq. yd.; The Catto Granite Co., Westerly, R. I., $1.39 per sq. yd.; New England Granite Works, Westerly, $1.40 per sq. yd.; New England Granite Works, Westerly, $1.25 per sq. yd.; The Webb Granite Construction Co., Worcester, Mass., $1.81 per sq. yd.

New York, N. Y.—Repaving with asphalt block on required foundations, over street openings, fire burns, etc., when and where designated, in the Borough of Bronx during year and setting curb where necessary, Hastings Pavement Co., 25 Broad st., lowest bidder, as follows: 4,000 sq. yds. completed asphalt block pavement, including concrete foundation and mortar bed, and keeping the same in repair for one year from date of contract, $2.60; 500 sq. yds. completed asphalt block pavement, including mortar bed only, and keep same in repair for one year, $2.12, and 500 lin. ft. old curb reset in concrete, including concrete foundation, 95c.; total $11,935; Barber Asphalt Co., $13,580. Repaving with asphalt on required foundations over street openings, fire burns, etc., when and where designated in the Borough of the Bronx, during the year: Asphalt Construction Co., Madison ave. and 137th st., $8,675, and Barber Asphalt Paving Co., $11,317. Regulating, grading, setting curb, flagging sidewalks, laying crosswalks, building approaches and placing fences in Ludlow ave., Ciavanni & Cavalluzzo, $10,522; J. D. Menna, $9,300; T. Mancinni, $11,584; H. Soroden, $9,930, and L. J. Moran, $8,987.

Rochester, N. Y.—Paving, bidders: Whalen st., brick paving, Louis D. Argento, $3.863; Capron st., asphalt paving, Julius Friedrich Co., $4,463; Tallinger alley, asphalt paving, Julius Friedrich Co., $3,222.50; Bryan st., asphalt paving, F. C. Lauer & Sons Co., $11,193; Selyelingbury st., asphalt paving, F. C. Lauer & Sons Co., $11,193; Seyle Terrace, asphalt paving, F. C. Lauer & Sons Co., $11,313; Girard st., asphalt paving, F. C. Lauer & Sons Co., $2,756.50; Orleans st., brick paving, Brayer & Albaugh, $2,005; Grover st., walks, Henry Schoenfeldt, $447; Julia st., brick paving, Louis D. Argento, $2,946; Parsells ave., sewer, H. N. Cowles. $765; Lux st., sewer, William H. Sours, 2d, $3,541; Wangman st., brick paving, H. N. Cowles, $2,212; Depew and Grove sts., cement walks, Henry Schoenfeldt, $519 and $447, respectively.

Butler, Pa.—Street paving, John Schaffner, block, $1.40; hillside, $1.45; excavating, 40c.; curbing, 50c.; N. J. Boyer, block, $1.29; hillside, $1.34; excavating, 45c.; curbing, 53c.; F. E. McQuistion, block, $1.32; hillside, $1.36; excavating, 36c.; curbing, 52c.; Tony Morelli, block, $1.21; hillside, $1.23; excavating, 25c.; curbing, 52c.

Scranton, Pa.—Paving six streets, bidders: McDonald & Co., $1.73 per sq. yd.; Warner-Quinlan Co., $1.89; R. C. Ruthven, Jefferson and Monroe aves. and Gibson st., $1.89; N. Washington ave., $2.24; Forest and Hitchcock courts, $2.04.

Dallas, Tex.—Paving Patterson ave.: John C. Underwood, Houston, vit. brick on a 5-in. gravel concrete foundation, with five years' maintenance, $2.56 per sq. yd.; same with ten-year maintenance, $2.85; same without maintenance, $2.50; combination curb and gutter, 60c.; curved curb and gutter, 65c. Texas Bitulithic Co., bitulithic paving on 5-in. gravel concrete base, with five-year maintenance, Jacksboro rock, $2.30; same Arkansas rock, $2.44; same Liano granite, $2.49; without maintenance, same items, $2.22, $2.36, $2.41; bitulithic on a bituminous foundation, with five-year maintenance, Jacksboro rock, $2.30; Arkansas rock, $2.44; Liano granite, $2.49; same without maintenance, curb, straight, 65c.; curved, 75c. F. O. Brown, Buffalo block bricks, five-year maintenance, gravel concrete base, $2.70; ten-year maintenance, $2.85;; no maintenance, $2.70; curved combination curb and gutter, 75c.; straight curb and gutter, 65c. Ockander Bros., brick, five-year maintenance, gravel concrete foundation, $2.70; ten-year maintenance, $2.80; no maintenance, $2.65; General Supply and Construction Co., vit. brick on a 5-in. gravel concrete base with five-year maintenance, $2.65.

Repairing street—Ockander Bros., $1.95 per superficial sq. yd. with 15 per cent added for all repairs between street railway tracks and 18 in. on each side of the rails. F. O. Brown, $1.05 per sq. yd. for resurfacing work and $2.25 where entirely new work is to be put in instead of bois d'arc block patches; for repairing holes less than 5 sq. yds. $2 per sq. yd., less than 10 sq. yds. and more than 5 sq. yds., $1.95, more than 10 and less than 20 sq. yds., $1.80; more than 20 and less than 50 sq. yds., $1.75; more than 50 and less than 100 sq. yds., $1.65; more than 100 and less than 200 sq. yds., $1.50; 10 per cent additional to be added for repairs between street railway tracks.

Houston, Tex.—Paving, W. S. Hipp, city, low bidder, $59,540 for paving Western Air Line rd., 18 miles in length, with shell; $9,350, for paving La Porte and Seabrook rd., 2½ miles long, with shell, and $32,960 for paving Main st. rd., 8 miles long, with gravel and shell; M. O. Otto, lowest bidder, $16,700 for paving Lynchburg and Crosby rd., 3 miles long, with clamshell, and Texas Grading Co., $16,876, for paving Westheimer rd., 4 miles, with gravel and shell.—John B. Ashe, County Auditor.

Salt Lake City, Utah.—Six-ft. and 4-ft. walks, D. Hanley, $1.18 for 6-ft. and $1 for 4-ft.; Gillis Construction Co., $1.25 and 79c.; Moran Construction Co., $1.62 and 98c.; Kennedy Construction Co., $1.38 and 84c.; Zerbe & Walker, $1.92 and $1.07; S. Birch & Sons, $1.49 and 98c.; McKay & Reed, $1.30 and 82c.; Chatfield & Cutler, $1.38 and 82c.; concrete retaining wall on Eleventh East st., 260 cu. yds., J. D. Hanley, $7 per cu. yd.

Superior, Wis.—Paving John ave., low bidders: Asphalt block, Diffor & Riches, $41,106.47; brick, same firm, $41,822.47; bitulithic, same firm, $46,972.47; creosoted block, E. W. Van Hatten, $43,052.21.

Moose Jaw, Sask., Can.—Concrete sidewalks; Ontario Concrete Paving Co., Toronto, $17,490; R. L. Frost, Moose Jaw, $18,656; Forest City Paving Co., Regina, $19,472; Western Pavers. Ltd., Winnipeg, $20,210; Navin Bros., Moose Jaw, $20,988; Clark & Jones, Owen Sound, $23,028. For curb and gutter: Ontario Concrete Paving Co., Toronto, $6,480; Navin Bros., Moose Jaw, $8,100; R. L. Frost, Moose Jaw, $8,100; Clark & Jones, Owen Sound, $8,100; Western Pavers, Ltd., Winnipeg, $8,505; Forest City Paving Co., Regina, $8,775; National Paving Co., Winnipeg, $13,500. Material for and construction of 33,300 sq. yds. of pavement: (1) Bitulithic & Contracting, Ltd., Winnipeg, bitulithic pavement, wearing surface 2-in. to 2¾ in. thick, $103,152; 3-in. cresote block pavement, wearing surface, 1½ in., $94,931; 3-in. creosote block pavement, $116,472. (2) Rudolph S. Blome Co., Chicago, granatoid pavement, 1½-in. wearing surface, $105,184. (3) National Paving & Contracting Co., Winnipeg, natural asphalt sheet pavement, wearing surface 1½ in., $94,931. (4) Forest City Paving Co., Regina, creosote wood block pavement, wearing surface 3 in., $103,230. (5) Navin Bros., Moose Jaw, 3-in. asphalt block pavement, $120,750; 2½-in. block, $107,763. (6) The Kettle River Co., Minneapolis, cresoted wood block pavement, thickness of wearing surface 3 in., 3½ in., and 4 in.; 3-in. block, 14 x treatment, $103,400; 3-in. blocks, 16 x treatment, $106,064; 3½-in. blocks, 14 x treatment, $111,725; 3½-in. blocks, 16 x treatment, $114,389; 4-in. blocks, 16 x treatment, $124,379. (7) Fielding & Shepley, St. Paul, cresoted wood block pavement, 3½-in. wearing surface, $117,070. (8) McKay Construction Co., Regina, Westrumite pavement, 2-in. wearing surface, $89,244.

Stratford, Ont., Can.—Pavements, as follows: Armoured concrete, $1.41 per sq. yd., Todd & Co.; tralithic, $156, J. Conn; granite block, $3.90, Hassan Paving Co.; compressed concrete, $1.79, Hassan Paving Co.; Apposite, $1.77, Hassan Paving Co.; concrete macadam, $1.25, Fielder & Co.; asphalt block, 3-in. block, $2.56, Fielder & Co.; asphalt block, 2½-in. block, $2.29, Fielder & Co.; asphalt block, 3-in. block, $2.58, R. Bangham; asphalt block, 2½-in. block, $2.30, R. Bangham; vit. brick, $2.59, Fielder & Co.; vit. brick, $2.30, Crowley & McDonnell; vit. brick, $2.37, Gibb Construction Co.: vit. brick, cement filler, $2.22, Gibb Construction Co.; Westrumite, $1.97, Westrumite Co.; bitulithic, $2.25, Warren Bituminous Co.; creosote block, 3-in., $2.32, Hyde, Jr.; cresote block, 4-in., $2.47, Hyde Jr. Prices as based on Nat Elger's tender for excavation, 34c., and Secord & Sons' tender for concrete base, 51c. Concrete curbs and gutters: Concrete curbing, 18 in., Crowley, 37½c.; Fielder, 60c.; L. Malcolm, 38c.; Conn, 41c.; Todd & Co., 33c.; Gibb, 32c. Gutter, 16 in. wide: Crowley, 19c.; Fielder, 23c.; L. Malcolm, 15c.; Conn, 24c.; Gibb, 17c. Gutter, 14 in. wide: Crowley, 17c.; Fielder, 21c.; L. Malcolm, 13c.; Conn, 22c.; Gibb, 15c. Combined 6-in. curb and 14-in. gutter: Crowley, 38c. Fielder, 43c.; L. Malcolm, 48c.; Conn, 40c.; Gibb, 35c.

Toronto, Ont., Can.—Paving, bids opened April 19, Claremont st. with asphalt, to Construction and Paving Co., $9,841; College st. with asphalt block, and Oak st. with asphalt, to Barber Asphalt Co., $9,326 and $43,964, respectively; Godson Contracting Co., St. Clarens ave., with asphalt, $11,650, and Greenwoods ave. with vit. block, $76,775; Warren Bituminous Paving Co., with bitulithic, Gore Vale ave., $11,000.

SEWERAGE

Oakland, Cal.—Draining and Sanitary Committee has instructed City Engineer to prepare plans for sewering 25th st.

Porterville, Cal.—Citizens will vote May 17 on $50,000 bonds for sewer and street improvements.

Santa Ana, Cal.—Citizens will vote on bonds for outfall sewer to empty into head of Newport Bay; cost $35,000.

Sonoma, Cal.—Citizens will vote on $20,000 bonds for construction of sewers.

Salida, Col.—Council has made arrangements for plotting grounds; bids for sewer construction will be asked when work is completed.

Telluride, Col.—Contract will be let early in May for construction of the proposed sewer system for West Telluride; cost $14,000.—J. S. James, City Engineer.

Macon, Ga.—Mayor will shortly appoint Consulting Engineer, whose compensation shall be fixed by Finance Committee, to co-operate with City Engineer in directing construction of new sewers.

Hailey, Ida.—Council is considering calling election on bonds for construction of sewer system.

Astoria, Ill.—Construction of sewer system is being considered.

Bushnell, Ill.—Citizens have voted $25,000 bonds to install sewerage system.

Madison, Ill.—Council has passed on first reading ordinance providing for construction of sewer system; cost $184,000.

North Crystal Lake, Ill.—City has selected Hugh M. Price, 1207 Hartford Bldg., Chicago, to prepare plans for sewer system and purification works; cost $25,000.

Richmond, Ind.—Bids have been rejected by Board of Public Works for sewer in alley north of North I st.

Bedford, Ia.—Council has decided to construct additional system of sewerage from State st. to center of the intersection of Breckenridge and Pennsylvania sts.—Elmer T. Brice, City Clerk.

Mason City, Ia.—Plans and specifications have been adopted by Council for construction of sewers on East Huntley and Howard sts.

Oskaloosa, Ia.—City is considering installation of sewer; cost $2,000.

Elkton, Md.—Town will vote on $75,000 sewer, water and electric light bonds.

Swampscott, Mass.—Town has voted $14,000 bonds for sewer improvements.

Charlotte, Mich.—Council has ordered sewer construction in Oliver st.

Howell, Mich.—Council has decided to extend Walnut st. sewer.

Manistee, Mich.—Council will construct sewers in Lake, Cross and Quincy sts.

Duluth, Minn.—Storm sewer will be laid on Grand ave.

Vicksburg, Miss.—Council has appropriated $8,000 additional for completion of sewerage system.—J. J. Hayes, Mayor.

Miles City, Mont.—Bids will be received in about five weeks for installation of sewers, water works and electric lights; $230,000 available.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., Engineers.

Manchester, N. H.—Council has voted $100,000 bonds for permanent sewer and highway improvements.

Atlantic City, N. J.—Council has voted to save over $1,000,000 by building closed concrete conduit to carry off surface water instead of the proposed 60-ft. wide open drainage canal called for by "city beautiful" plans.

Belleville, N. J.—Health Inspector W. Brand Smith is urging installation of sewerage system for Silver Lake.

Comstock, N. Y.—New bids will be received by C. V. Collins, Superintendent of State Prison, Capitol, Albany, for sewage disposal system at Great Meadow Prison; other bids rejected.

North Tonawanda, N. Y.—State Health Department has approved plans for Rumbold ave. sewer; cost $30,000. Address City Engineer Smith.

Schenectady, N. Y.—City Engineer Fitzgerald, in near future, will have order introduced in Council authorizing purchase of site for sewage disposal plant.

Carrington, N. D.—Citizens have voted to construct sewer system; cost $20,000.

Cincinnati, O.—Chief Engineer Shipley and Assistant Chas. Razinsky are inspecting various sewage disposal plants; proposition to supply Westwood with plant is being considered.

Youngstown, O.—Council has decided to construct sewer in Logan ave.—M. F. Hyland, Clerk.

Bristow, Okla.—Bids will be received May 16 for $50,000 bonds for sewer system and disposal plant.—C. A. West, City Clerk.

Cherokee, Okla.—Bids will be received in about five weeks for sewer system.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., Engineers.

Fairfax, Okla.—City is considering election on $50,000 bonds for construction of sewerage system and water works.—Harry S. Buford, City Clerk.

Yukon, Okla.—Plans are being prepared by Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., for installation of sewers and water works; cost $50,000.

Johnstown, Pa.—Council is considering construction of sewers in Eleventh and Twentieth Wards and Church ave.

McKeesport, Pa.—Alexander Potter has been recommended by City Engineer Smith to Councils as Engineer to have charge of work of preparing plans for comprehensive sewer system and sewage disposal plant; bid for doing work is $3,900.

Philadelphia, Pa.—Plans are about completed for first sewage disposal plant to be constructed by city at Holmesburg.

South Bethlehem, Pa.—Bids are being received for storm sewer construction.

West Chester, Pa.—Citizens will again vote on borrowing $200,000 for installation of sewerage system and disposal plant.

Dallas, Tex.—Council has adopted resolutions for construction of 6-in. sanitary sewers in six streets and alleys.

Racine, Wis.—Council has adopted plans for construction of a sewer in 17th st.—P. H. Connolly, City Engineer.

Chehalis, Wash.—Council is considering construction of sewer and drainage district in eastern and southern portion of the city; cost $80,000.

Amherst, N. S., Can.—Ratepayers have authorized the Council to borrow $30,000 for extension of sewerage system.

Cumberland, B. C., Can.—City proposes to construct sewer system; cost $20,000; engineer not yet selected.—A. M. Kinnon, City Clerk.

Estevan, Sask., Can.—Citizens have voted $25,000 sewer by-law.

Ottawa, Ont., Can.—Plans for west end sewage disposal works have been approved by Provincial Board of Health.

Vancouver, B. C., Can.—Citizens will vote on sewer by-law carrying $500,000.

Wingham, Ont., Can.—Plans for sewage purification have been approved.

Winnipeg, Man., Can.—Board of Control will call for tenders for following sewers: Martin ave., $4,251; Tweed ave., $4,983; Basswood pl., $2,411; Sherbourn st., Andrews and Martin streets.

CONTRACTS AWARDED

Oakland, Cal.—Sewering Oak and 10th sts., to John Sorenson.

Canton, Ill.—Storm sewer, 7,750 ft. 10-in., 4,851 ft. 12-in., 3,241 ft. 15-in., 1,300 ft. 18-in., 1,800 ft. 20-in., 2,900 ft. 22-in., and 431 ft. 24-in. pipe; 2,300 ft. 30-in., 1,510 ft. 33-in., 2,350 ft. 36-in. and 900 ft. 42-in. brick sewers, from 31c. to $3.80; manholes, $10 to $30; E. R. Harding Co., Racine, Wis., low bidder, $51,238.79; Ottawa Construction Co., Ottawa, $51,433.39; H. J. Rees, Quincy, $51,582.05; Independence Construction Co., Davenport, Ia., $54,586.67; Althaus Construction Co., St. Louis, $54,461.23; W. C. Jucksch, St. Louis, $55,275.59, and F. M. Benner & Co., Marion, Ind., $63,362.63.—O. R. Beam, City Engineer.

Galesburg, Ill.—Sewer, to Mart O'Connor, $8,833.

Chatham, N. J.—Pipe sewers, 8-in. to 15-in. diameter, 8 miles, to Clarke & Co., Morristown, $36,457.95.—Clyde Potts, 30 Church st., New York City, Engineer.

Schenectady, N. Y.—Laying sanitary sewers in Allamont and Cresler aves., to Thos. R. Crane.

Reidsville, N. C.—Sewer, 10 miles, to H. M. Garvey and John L. O'Connor, Knoxville, Tenn., including three sewage pumping stations and reduction tank; cost $42,000.—E. W. Myers, Greensboro, Engineer.

Hamilton, O.—Third Ward sanitary sewer, to W. H. Louthan, $11,066.20; North E st. sewer, to Garner Contracting and Transfer Co., $1,631.

Lorain, O.—Building an extension to the Oberlin ave. storm sewer, to Faragher & Randall, $26,736.

Sebring, O.—Constructing sewage disposal plant, bids opened April 20, to John Skeeles, Canton, $17,605.

Klamath Falls, Ore.—Constructing entire sewer system to Clues Construction Co., as follows: Laying of pipe, including Ys and Ts, in earth: 6-in. pipe, 37c.; 8-in., 40c.; 10-in., 43c.; 12-in., 46c.; 14-in., 50c.; Laying pipe in rock: 6-in. pipe, $1.50; 8-in., $1.55; 10-in., $1.60; 12-in., $1.65; 14-in., $1.70; septic tank, $2970; manholes, $45, and inspection holes, $5; furnishing pipe to Gladding, McBean & Co., San Francisco, as follows: 6-in. pipe, 21c.; 8-in., 31½c.; 10-in., 48c.; 12-in., 60c.; 14-in., 80c.; Price of Ys each: 6x4, 42c.; 8x4, 63c.; 10x4, 96c.; 10x6, 96c.; 12x4, $1.20; 14x4, $1.60; Price of Ts: 6x4, each, 42c.; 10x6, 96c.

Tacoma, Wash.—Completion of Park ave. drainage district and sanitary sewer work in District No. 149, to L. Y. Stayton, $2,100 and $1,800, respectively.

Toronto, Ont., Can.—Main drainage works, four sections of the trunk sewer east of the Don, as follows: Section 1, 3,409 ft., from Logan ave. to Leslie st., sewer 9 ft. and 9 ft. 3 in., to John Wagner & Co., Cleveland, O., at $31 per ft.; section 2, 2,993 ft., from Don to Logan ave., sewer 8 ft. 9 in., to J. H. McKnight Construction Co., $30.85 per ft.; section 7, 3,246 ft., Leslie st. to Morley ave., sewer 9 ft. 6 in., to W. J. Gawne, Cleveland, O., $23.70 per ft.; section 8, 1,216 ft., from Morley ave. to the tanks, flat sewer, 7 ft. 10 in. x 10 ft., to Yayman, Nicholson & St. John, Cleveland, O., $19.25 per ft.

Juarez, Mex.—Sewer system, 14 kilometers, to Compania Bancariade Fomento de Bienes Raices, S. A., Mexico City.

BIDS RECEIVED

Chatham, N. J.—Pipe sewers, 8 miles, from 8-in. to 15-in. diameter. Bidders: Clarke & Co., Morristown, $36,457.95; Garifano & Mezzano, Summit, $36,949.01; Hudson Terminal Construction Co., New York City, $37,443.02; Louis Jacques, Elizabeth, $37,542.15; Antonia Costa, Orange, $39,732.16; Fusco Construction Co., Montclair, $42,191.59; Westmorland Construction Co., Greensburg, Pa., $42,244.29; Harrison Construction Co., Newark, $44,219.99; Joseph Puglia, Paterson, $45,985.23; Charles Ippolito, Orange, $46,143.62; John MacNabb, Bound Brook, $47,239.54; Ludwig Bott, S. Orange, $50,912.20; Pasquale & Maurellio, Orange, $56,785.83; F. W. Abbot Co., New York City, $57,737.04, and Pasquale Cestone, Montclair, $59,940.32.—Clyde Potts, 30 Church st., New York City, Engineer.

WATER SUPPLY

Eufaula, Ala.—Citizens of Louisville are seriously considering building of water and electric light plant.

Mobile, Ala.—Town of Crichton is considering matter of water works. E. G. Rickarby is interested.

Fort Smith, Ark.—City has decided to extend water works; 6-in. or 24-in. pipe; 50 to 100 hydrants; cost $75,000.—W. J. Johnston, Mayor.

Searcy, Ark.—Bids will be received May 16 for purchase of $76,000 water and sewer bonds.—J. P. Headlee, Secretary Board of Commissioners Water Improvement District No. 1.

Oakland, Cal.—Council has passed ordinance appropriating $4,000 for improvement of south side of 12th st. dam.

Sacramento, Cal.—Council has given first reading of new ordinance calling another $660,000 bond election for filtration plant.

Pueblo, Col.—Securing of better water supply for both north and south side is being considered.

Port Tampa, Fla.—Citizens will vote on $20,000 bonds for construction of water works.

College Park, Ga.—City has selected Solomon-Norcross Co., Atlanta, Ga., to prepare plans for water works system.

Fairburn, Ga.—City is considering construction of water works and electric light plant.

Vollmer, Ida.—Town is considering construction of large concrete reservoir.

Carpentersville, Ill.—Citizens defeated proposed bond issue for water works.

Dundee, Ill.—Citizens have voted $6,000 bonds for water mains extensions.

Bloomington, Ind.—Council has decided to make extensions to water mains at cost of $10,000.

Burlington, Ia.—Bids have been rejected for construction of pumping plant and Engineer's residence.

Carson, Ia.—Citizens will vote this summer on construction of water works.

Council Bluffs, Ia.—Installation of fire plugs in vicinity of 25th st. and 4th ave. is being urged.

Hampton, Ia.—City will purchase new pump for water works plant.

Manchester, Ia.—City is considering matter of water meters.—Edw. Henby, City Clerk.

Emporia, Kan.—Citizens have voted $11,000 bonds for extension of storm water sewers.—Alvah J. Smith, City Engineer; G. O. Mathewson, City Clerk.

Hutchinson, Kan.—Council has ordered extension of water mains on portions of 21 streets.—G. W. Winans, Acting Mayor.

Inman, Kan.—City will expend $5,000 in water works improvements.

Lincoln, Kan.—City proposes to purchase a pumping engine; cost about $12,000.—F. H. Dunham, City Clerk.

Wichita, Kan.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing plans for construction of concrete dam across Arkansas River; bids will be received on their completion; cost about $25,000.

Biddeford, Me.—Mousam Water Co. of Kennebunk has completed arrangements for extension of its service to Beachwood and Fortune Rocks.

Elkton, Md.—Town will vote on $75,000 water, sewer and electric light bonds.

Russell, Mass.—City is about ready for bids on construction of water works and desires figures on 4, 6 and 8-in. iron pipe and other material.—E. D. Parks, Chairman Water Commissioners.

Springfield, Mass.—West Springfield Water Commissioners have decided to order carload of 6-in. pipe for Ohio ave., Tatnam.

Grand Rapids, Mich.—City will purchase site near Canal and Quimby sts. for proposed filtration plant.

Marquette, Mich.—Citizens will vote May 7 on $75,000 bonds to improve water works.—J. P. Kern, Secretary Fire and Water Commissioners.

Anoka, Minn.—Citizens have defeated proposition to issue $60,000 bonds for erection of dams on Elk River for supply of water.

Chisholm, Minn.—Water, Light and Power Commissioners have decided to remodel water plant and lay several miles of new water pipe. C. D. Purple is interested.

Minneapolis, Minn.—Hering & Fuller, New York City, will prepare plans and specifications for proposed mechanical filtration plant; work will begin in 60 days.

Stillwater, Minn.—Council has decided to purchase plant of Stillwater Water Co.

Two Harbors, Minn.—Council is considering extension of intake pipe 400 ft. further into lake.

Biloxi, Miss.—Need of additional water mains is being considered.

Kennett, Mo.—Archer, Rollins & Co.,

Kansas City, are preparing plans for water works; cost about $40,000.

Mexico, Mo.—City is considering installation of some sort of purification system.

Miles City, Mont.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., have prepared plans for installation of water works, sewers and electric lights; bids asked in about five weeks; $230,000 available.

Beatrice, Neb.—Citizens will vote May 31 on $70,000 bonds for water plant from wells.

Grand Island, Neb.—City is considering enlargement of water plant.

Milford, Neb.—City proposes to issue about $18,500 bonds for constructing water works and electric light plant.—J. H. Perkinson, Mayor.

Utica, Neb.—Citizens will vote May 10 on installation of water system.

Atlantic City, N. J.—Council is considering extension of municipal water system for purpose of supplying salt water through high pressure mains to colleges and hotels and for fire service between certain streets; $175,000 bonds will be issued.

Atlantic City, N. J.—City has sold $160,000 water shed bonds to Gilman & Ciucas and Proctor & Borden, New York.

Belleville, N. J.—Township Committee is considering improvement of water system in northern section.

Gloucester, N. J.—Council President O'Hara has suggested that Water Works Committee look into sinking of more wells; committee will at once secure estimates on price of water meters.

High Bridge, N. J.—Residents have voted to extend water system.

Paulsboro, N. J.—Citizens will vote June 7 on $50,000 bonds for purchase of water plant.

Perth Amboy, N. J.—Board of Water Commissioners has decided to extend 6-ft. water main in Donald ave. and Harrington st.

Plainfield, N. J.—Citizens have given Council power to purchase by condemnation water plant of city, to erect new plant or to make another contract with the Union Water Co., a private corporation.

Saranac Lake, N. Y.—Village Engineer has estimated cost of water mains on Algonquin ave. at about $7,885.00 and Lake ave. at $5,316.60.

White Plains, N. Y.—Special Committee has recommended abandonment of sinking Central ave. well and diverting headwaters of St. Mary's Lake and instead sinking of large well on westerly side of swamp; also recommended that Mr. Quimby be employed to make test borings, this matter to be taken up at once.—F. D. Hopkins and E. M. Bond, Committee.

East Spencer, N. C.—City has selected J. B. McCrary & Co., Empire Bldg., Atlanta, Ga., to prepare plans and specifications for water works.—H. C. Bueck, Mayor.

Franklin, N. C.—Citizens have voted $20,000 bond issue for water works.—F. L. Siler, Mayor.

Mandan, N. D.—City Commissioners have taken up establishment of water works system.

Chelsea, Okla.—City has made appropriation for filter plant.

Cherokee, Okla.—Plans are being prepared for installation of water works system; bids will be received in about five weeks.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., Engineers.

El Reno, Okla.—Council has decided to purchase plant of El Reno Water Co.; election will be held at once.

Fairview, Okla.—City is considering improvement of water and light system; I. C. Barr Co., Joplin, Mo., has made following estimates: Extension of water and light system, $5,000; double present power and extend power house, $10,000; water tower, $4,500; additional pump and motors, $5,000.

Francis, Okla.—Citizens have voted bond issue for construction of water works.

Okeene, Okla.—City is considering construction of proposed water works.

Wagner, Okla.—Town is negotiating with the Water Co. for purchase of plant; if this is done mechanical filter plant will be installed.

Yukon, Okla.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing plans for municipal water works and sewers for city; cost about $50,000.

Falls City, Ore.—Citizens have voted to issue bonds for construction of a gravity system of water works.

Mitchell, Ore.—Bids will be received May 10 for $7,000 water bonds.

Portland, Ore.—Bids will be received May 23 for $1,000,000 water bonds.

Pittsburg, Pa.—City will invite bids shortly for three high duty pumping engines, vertical compound or triple expansion, of 45,000,000 to 50,000,000 gals. aggregate capacity.

West Grove, Pa.—West Grove Water Co. will introduce meters in town.

Easley, S. C.—Citizens have voted $29,500 bonds for construction of water and electric light plant.

Williamston, S. C.—Election on bonds for construction of water works is being considered.

Brandt, S. D.—Citizens will vote on bond issue for installation of water works system.

Gettysburg, S. D.—Citizens have voted to construct water works.—J. W. Kennedy, City Auditor.

Decherd, Tenn.—C. E. Murray will install 15,000 to 40,000-gal. tower, pump and piping; cost about $5,000.

Alice, Tex.—Citizens have voted $15,000 water works bonds.

Alpine, Tex.—Alpine Power Co. has asked for 50-year franchise to furnish water and light.

Dallas, Tex.—City has advertised for bids for 600 tons of 6-in. and 8-in. c.-i. water pipe.

Temple, Tex.—Municipal Water Commissioners will soon advertise for bids for construction of water filtration plant; daily capacity 200,000 gals., with clear water well of 500,000 gals. capacity.—N. Werenskiold of Dallas, Consulting Engineer of Water Commission.

Ephraim, Utah.—Water works plant will be installed by company formulated by citizens; capital $50,000. Ephraim Peterson, H. F. Nielson, A. C. Bosen, W. G. Barton, P. C. Anderson, Andrew Thompson, P. D. Jensen, James L. Jensen, Henry Beal, Sr., and Joseph E. Anderson are interested.

Graham, Va.—Graham Water and Electric Co. is considering water works improvements.—V. L. Sexton, President.

Marion, Va.—Citizens will vote May 10 on $12,000 bonds for improvement of water works system.

Petersburg, Va.—City will construct service reservoir.

Waynesboro, Va.—Citizens will vote May 24 on $8,000 bonds for improvement of water works.

Fairmont, W. Va.—Council is considering ordinance to bond city for $75,000 to improve water system and construct bridge on Fourth st.

McMechen, W. Va.—Council has taken up matter of installation of fire plugs.

Williamson, W. Va.—Citizens have voted $47,000 bonds for improvement of water works.

La Crosse, Wis.—Jas. T. Day, President Board of Public Works, has recommended laying of water pipes.

Wheatland, Wyo.—Citizens have voted $75,000 bonds for the construction of water works, sewer system and electric light plant.

Dauphin, Man., Can.—Citizens have passed water works and sewerage by-law carrying $175,000.

Latchford, Ont., Can.—Provincial Board of Health has approved plans for water works for Latchford.

St. Boniface, Man., Can.—City will increase the water supply and establish filter plant for the water of Red River.

CONTRACTS AWARDED

Riverside, Cal.—Furnishing and laying 40,000 lin. ft. 30-in. steel water pipe for Riverside Water Co., to Lacy Mfg. Co., Los Angeles; cost about $100,000.

Ft. Collins, Col.—Furnishing water pipe, to Joe Finger, city, $42,800.—Robt. J. Fedder, Clerk.

Boonville, Ind.—Constructing water works, lake and pipe line, to Foster & Raiser Construction Co., Union City, $18,865.

Fort Wayne, Ind.—Iron pipe, 150 tons, to American Pipe and Foundry Co., Kansas City, Mo., $25 per ton.

Russell, Kan.—Dam at water works, to Henry Bowman, Lawrence, $17,176.

Guilford, Me.—Water works for Guilford Water Co., to Chas. N. Taylor, Wellesley, Mass., $65,000.

Baltimore, Md.—Erection of gatehouse in connection with Forest Park reservoir, to C. L. Stockhausen for $14,960.

Everett, Mass.—Water pipe, to C. Millar & Sons Co., Utica, N. Y., 6-in. and 8-in. $25.40 ton; specials, 2¾c. lb.; Donaldson Iron Co., Emaus, Pa., $326.36, 2½c.; R. D. Wood & Co., Philadelphia, $26.65, 2¾c.; U. S. C. I. Pipe and Foundry Co., $26.55, 2¾c.; F. A. Houdlette & Son, Boston, $25.75, 2½c.; John Fox & Co., New York, $26.40, 2½c.

New Bedford, Mass.—Furnishing 2,000 ft. 2-in. genuine galvanized pipe, to Braman, Dow & Co., Boston, $13.68 per 100 ft.

Eveleth, Minn.—Installing water system, to Pastoret & Lawrence, Duluth, $2,400; excavating all rock, 80c. per cu. yd.

Youngstown, O.—Water pipe, 515 tons, to J. B. Clow & Sons, Chicago, Ill., $25.15 per ton.

Florence, S. C.—Certain extensions to water works as follows: Laying pipe, taking up old pipe and making connections, to Johnson & Matthews Construction Co., city, $4,939; furnishing c.-i. pipe and specials f. o. b. cars Florence, S. C., to American Cast Iron Pipe and Foundry Co., Birmingham, $26.50 per ton for pipe and $55 per ton for specials, total, $13,101; furnishing hydrants, valves, valve boxes, f. o. b. cars, Florence, to Columbian Iron Works, Chattanooga, Tenn., $1,216, and furnishing air compressor for deep well pump machinery, f. o. b. cars, Florence, to Ingersoll-Rand Co., New York, $2,425.

Orange, Va.—Water works, to J. E. McMahone, Norfolk, $25,073.03.—Wm. Noble, Engineer.

Milwaukee, Wis.—Repairing intake crib, North Point pumping station, to W. H. Gillen, $6,960.

Toronto, Ont., Can.—Furnishing c.-i. pipe, to National Iron Works, $4.35 per length for 3-in. pipe; $4.88, 4-in. pipe; $6.97, 6-in. pipe; to Canada Foundry Co., $10.50 per length for 8-in. pipe, $14.80, 10-in. pipe; $19.85, 12-in. pipe.

BIDS RECEIVED

Baltimore, Md.—Pumping station of Fire Department pipe line, Noel Construction Co., lowest bidders, $15,000; other bidders on the pumphouse were Daniel E. Evans, $132,000; Benjamin F. Bennet, $133,351; Charles Stockhausen, $132,000; Henry Smith & Sons Co., $134,000, and John Waters, $138,338.

New Bedford, Mass—Furnishing 2,000 ft. of 2-in. genuine galvanized w.-i. pipe: Wood, Brightman & Co., $15.50 per 100 ft.; New Bedford Boiler and Machine Co., $14.40 per 100 ft.; Babbitt Steam Specialty Co., $14.40 per 100 ft.; Walworth Mfg. Co., Boston, $13.70 per 100 ft.; Braman, Dow & Co., Boston, $13.68 per 100 ft.

LIGHTING AND POWER

Bear Creek, Ala.—N. W. Benefield is planning to construct water power electrical plant, including construction of dam.

Eufaula, Ala.—Citizens of Louisville are seriously considering building of electric light and water plant.

Green Forest, Ark.—Company has been organized to construct electric light, ice and cold storage plant; cost $5,000. Ben Horbert, F. R. Morrow and others are interested.

Oakland, Cal.—Council has passed resolution authorizing erection of electroliers on E. 23d and E. 14th sts.

Oroville, Cal.—Oro Water, Light and Power Co. is contemplating running a power line to Palermo and putting in lighting system for houses.

San Francisco, Cal.—Noe Valley Improvement Club has petitioned Board of Supervisors to appropriate $1,000 for furnishing 10 arc lights on 24th and Castro sts.

Sonora, Cal.—Plans are being considered for further development of hydroelectric power plant of Sierra and San Francisco Power Co.

Colorado Springs, Col.—Empire Water and Power Co. has been formed, with a capital of $1,000,000, to supply towns, cities and manufacturing establishments with water, electric lights and power.—Wm. A. Otis, K. R. Babbitt and C. E. Titus, Incorporators.

Seaford, Del.—South Delaware Gas Co., recently granted franchise, will extend mains to Bridgeville.

Fairburn, Ga.—City is considering installation of electric light plant.

Stone Mountain, Ga.—Yellow River Power Co. has been incorporated, capital stock $1,000,000, to build water power electrical plant on Yellow River; will construct concrete dam to develop 15,000 h.p. for transmission by electricity; J. B. McCrary, Empire Bldg., Atlanta, Ga., and associates, Incorporators.

Braidwood, Ill.—Economy Light and Power Co. of Joliet has secured 50-year franchise for lighting village; company plans to purchase municipal plant.

Wheaton, Ill.—Council has sold electric light franchise and plant owned by city to Western United Gas and Electric Co.

Indianapolis, Ind.—Plans are under way for erection of power plant for Terre Haute, Indianapolis and Eastern Traction Co. at an estimated cost of $1,000,000.

Scottsburg, Ind.—Town Board has decided to install lighting system, the cost to be covered by bond issue, which has been sold to local bank; power will be purchased from the Indianapolis and Louisville Traction Co.; tungsten series lighting will be used; town will install all poles, wires, light fixtures, etc., and will keep the system in repair.

South Bend, Ind.—Architects Austin & Shambleau have completed plans for rebuilding power station on Colfax ave. and Sycamore st. for Indiana and Michigan Electric Co.; cost about $40,000.

South Bend, Ind.—Installation of additional lights on W. Colfax ave. is being considered.

Des Moines, Ia.—Plans for installation of electrolier system of street lighting on Grand ave. as far as Greenwood Park have been completed by Lighting Committee of Commercial Club.—Mack Olsen, Chairman.

Oakland, Ia.—Installation of electric lighting plant is being considered. Address Mayor Gardner.

Waterloo, Ia.—Mayor J. R. Rector has recommended placing of additional lights on business streets.

Fort Scott, Kan.—Fort Scott Gas and Electric Co. has adopted general plans for proposed power house. Address Superintendent Martin.

Sylvia, Kan.—Jas. Roberts, city, has purchased Sylvia electric light plant and will continue building up and extending system.

Baltimore, Md.—East Baltimore merchants are urging installation of 100 more lights on S. Broadway.

Elkton, Md.—Town will vote on $75,000 electric light, sewer and water bonds.

Fitchburg, Mass.—Connecticut River Transmission Co. has decided to extend electric power system and enlarge its dam across Connecticut River at Vernon, Vt.

Haverhill, Mass.—Haverhill Gas Co. has filed a new proposition with Municipal Council, by which it guarantees 90-cent gas at once and 85-cent gas after July, 1911; many improvements are promised if terms are accepted.

Westfield, Mass.—Town will vote May 4 on installation of wires of electric light department underground; estimates prepared.

Charlotte, Mich.—Election on bonds for municipal electric light plant is being considered.

Lansing, Mich.—North Lansing Power Co. is planning to erect proposed dam at North End this summer.—C. K. Madison, President.

Aurora, Minn.—Citizens will soon vote on $10,000 bonds for electric light plant.

Virginia, Minn.—Council has adopted recommendation of Light and Water Committee for establishment of "white way" for Chestnut st.

Miles City, Mont.—Bids will be received in about five weeks for installation of electric lights, water works and sewers; $234,000 available.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., Engineers.

Tipton, Mo.—Committee of citizens is securing estimates to present to Council calling for election for construction of an electric light plant; cost about $15,000.

Trenton, Mo.—Citizens have defeated proposition to issue $55,000 bonds for construction of electric light and power plant. R. T. Preston, City Clerk.

Annandale, N. J.—Establishment of municipal electric light plant is being considered.

Collingswood, N. J.—Installation of arc lights in number of sections is being urged.

Paterson, N. J.—Public Service Corporation is considering extension of gas mains into Little Falls Township and Totowa Borough.

Paulsboro, N. J.—Citizens will vote June 7 on $7,000 bonds for improving light plant.

Avon, N. Y.—Livonia Light & Heat Co. is planning to build transmission line from Livonia to plant in Avon, and to rebuild and put system in Livonia in first-class condition.—C. W. Richardson, Bath, President.

Dunkirk, N. Y.—Niagara, Lockport and Ontario Power Co. has offered proposition for sale of electricity to city, current to be distributed by city.

Gasport, N. Y.—Town Board has decided to have village connected with Middleport electric light system for streets and homes.

Mt. Vernon, N. Y.—Council has appropriated tentatively $6,000 for placing wires underground; Corporation Counsel will look into legal right of appropriation.

Lobella, N. C.—J. R. McQueen, Lakeview, has purchased Morrison Mill site on Lower Little River, and will erect electric plant to supply power.

Moorhead, N. D.—Installation of municipal gas plant is being urged.—A. M. Hopeman, City Engineer.

Martins Ferry, O.—Plans have been prepared for equipment for electric light plant; cost $23,000.—J. C. Hayne, Director of Service.

Altus, Okla.—City has sold $200,000 light, water and sewer extension bonds.

Cherokee, Okla.—Bids will be asked in about five weeks for installation of lighting plant.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., Engineers.

Fairview, Okla.—City is considering extending electric light system.

Forest Grove, Ore.—Haines Power Co. will extend lines to Hillsboro.

Norristown, Pa.—Chamber of Commerce has started movement for better lighted streets in business section.

Easley, S. C.—Citizens have voted $29,500 bonds for construction of electric light plant and water works.

Georgetown, S. C.—Council has granted permission to Georgetown Railway and Light Co. to erect poles and string wires for supplying of heat, light and power.—W. H. Andrews, Mayor.

Rapid City, S. D.—Citizens defeated proposition to grant electric light franchise.

Erwin, Tenn.—Nolachucky Power Co. has been granted charter to furnish power to city.

Trenton, Tenn.—Citizens have voted to purchase Keenan & Wade's electric light plant; will vote again May 20 on $12,000 bonds for installation of electric-light plant.

Alpine, Tex.—Alpine Power Co. has asked for 50-year franchise to furnish light and water.

Hempstead, Tex.—Company has been organized witn $10,000 capital stock to construct electric light plant.—J. D. Harvey, President.

Houston, Tex.—I. D. Polk has applied for franchise to construct and operate electric light and power plant.

Manti, Utah.—Council has purchased plant of Electric Light and Power Co., and will expend about $7,500 in improvements.

Spokane, Wash.—Olympic Power and Development Co. has been formed to harness three streams for generation of electricity.—W. B. Martin, James H. Carsten and James A. Calvert, of Seattle; E. A. Sims, of Port Townsend, and E. W. Molander, of Everett, Incorporators.

Wheeling, W. Va.—Light Committee has passed motion recommending to Council that Business Men's Association be permitted to install Tungsten lights on 12th st., and to give a demonstration of their value for street lighting.

Platteville, Wis.—Interstate Light and Power Co. will be able to supply power to Platteville and vicinity by July.

Sheboygan, Wis.—Resolution has been introduced in Council calling for appropriation for equipping water works plant for city lighting purposes; present contract with Sheboygan Light, Power and Railway Co. expires in June.

Fernie, B. C., Can.—Citizens will vote on $6,000 by-law for electric light extensions.

Winnipeg, Man., Can.—Tenders for equipment of McPhillips st. substation will soon be called.

CONTRACTS AWARDED

La Salle, Ill.—Ten miles of new wire, to Monarch Electric and Wire Co.

Chisholm, Minn.—Furnishing 34 posts for lamps on Lake st., to South Park Foundry Co., St. Paul, $50 per post.

Medford, Okla.—Electric light plant and water works as follows:—To E. J. Merkle, Kansas City, Mo., for 11,460 ft. of 4 and 6-in. pipe, and 10,000 lbs. special castings, $4,362; to English Iron Works Co., of Kansas City, Mo., for hydrants, $309; to H. N. Straight Mfg. Co., Kansas City, Mo., for one 75-h.p. Corliss engine, $1,300, and a 150-h.p. Corliss engine, $1,500; to Westinghouse Electric Mfg. Co., Kansas City, Mo., for 50-kw belted generator, $3,620, and to United Electric Co., Wichita, Kan., for line material, except poles, $2,521.

BIDS RECEIVED

Baltimore, Md.—Lighting, Consolidated Gas, Electric Light & Power Co., only bidder; for street lamps, $7.25 per year, the same as present rate; gas in municipal buildings, 80c. per 1,000 cu. ft.; 1,777 overhead arc lamps, price varies from $60.25 for one year to $55.90 for ten years; 965 arc lamps served by conduits, price varies from $75 for one year to $69.60 for ten years; current for city buildings, 6c. for the first 20,000 kw. per month, 5c. for next 20,000 and 4c. for all over 40,000; in City hall and Courthouse special rate is made of 3c. per kw. for the consumption of more than kw.

FIRE EQUIPMENT

Decatur, Ala.—Citizens have voted $25,000 bonds for erection of fire department, jail and city hall building.

Montgomery, Ala.—Bids will be received by Robert Tait, City Treasurer, until June 6, for installation of two steam fire engines,, Nos. 1 and 2; two combination chemical and hose auto cars, complete, and 6,000 ft. 2½-in. rubber-lined cotton hose.

Sheffield, Ala.—City will purchase hose wagon.—J. G. Frey, Chief.

Douglas, Ariz.—Bids have been asked for construction of an electric fire alarm system; specifications call for 20 boxes, 2 automatic switchboards, over 8 miles of wire and a 10-in. whistle.

Downieville, Cal.—City will purchase 200 ft. of new hose, 550 ft. of 5-in. screw steel pipe and two hydrants.

Oakland, Cal.—City Electrician George R. Babcock has submitted plans to Board of Public Works for police telegraph and fire alarm building to be erected at 13th and Oak sts.; cost $80,000.

San Francisco, Cal.—Residents of Sunset district are urging adequate fire protection.

New Haven, Conn.—Need of fire alarm signal system and fireproof fire headquarters is being considered.

Atlanta, Ga.—Fire Masters have adopted plans by Morgan & Dillon, city, for Ninth ward house; cost $12,000.

Fort Valley, Ga.—City is considering purchase of auto combination chemical.

Blue Island, Ill.—Installation of fire alarm system is being considered.—John Link, Chief.

Colchester, Ill.—Town has defeated proposition to purchase gasoline fire engine.

Good Hope, Ill.—Town has voted $1,600 to purchase fire engine and erect house for same.—Norman Benjamin, Village Clerk.

Waukegan, Ill.—Fire Chief S. O'Farrell has asked for overhauling of fire alarm system.

Fort Wayne, Ind.—Board of Safety has decided to replace about five miles of iron wire on fire alarm system.

Indianapolis, Ind.—Mayor Shank will recommend purchase of auto chemical.

Indianapolis, Ind.—Erection of fire house at South and New Jersey sts., cost $40,000, is being considered.

Dubuque, Ia.—Fire Chief Reinfried has asked for new engine and additional hose.

New Orleans, La.—Plans are being prepared by E. A. Christy, city, for engine house on Carrollton ave.; cost $10,000.

New Bedford, Mass.—Fire Department Committee is considering purchase of automobile chassis.

Big Rapids, Mich.—Chief D. Vincent has recommended purchase of chemical engine and installation of better fire alarm system.

Atlantic City, N. J.—City has sold $50,000 fire-house bonds to Gilman & Clucas and Proctor & Borden, New York.

Elizabeth, N. J.—Fire Chief Gerstung has recommended erection of engine house in Eleventh ward, substitution of chemical apparatus for hose wagons now in use and placing of all fire alarm wires in underground conduits.

Paterson, N. J.—Erection of fire headquarters building on Houten st. is being considered.

Perth Amboy, N. J.—Erection of building for Liberty H. & L. Co. is being considered.

Roosevelt, N. J.—Fire Committee will purchase site for erection of house for Company No. 2.

Falconer, N. Y.—Purchase of aerial truck is being considered.

Lockport, N. Y.—City will purchase $200 worth of equipment for aerial truck.

New York, N. Y.—Bids will be received May 6, 10.30 a. m., for establishing, building and equipping underground fire alarm telegraph system in Borough of Brooklyn.—R. Waldo, Fire Commissioner.

North Rose, N. Y.—Board of Trade has decided to buy fire engine, several ladders and buckets; fire company will be organized.

Akron, O.—Purchase of one or two automatic fire engines is being considered. Address Fire Chief Mertz.

Portland, Ore.—Bids will be received May 31 for furnishing city with two third size fire engines, one second size fire engine and two combination chemical and hose wagons.

Johnstown, Pa.—Purchase of auto for Chief Kellar, cost $2,500, has been authorized; Council is also considering creation of "flying squadron."

Phœnixville, Pa.—Council has ordered purchase of 250 ft. of chemical hose; purchase of 1,000 ft. of cambric hose is being considered.

Fort Worth, Tex.—Establishment of fire station on Lipscomb st. is being considered.

Houston Heights, Tex.—Mayor Barker has recommended installation of fire department and purchase of 2,000 ft. 2½-in. hose, one hose wagon and one hook and ladder truck.

SanAngelo, Tex.—Mayor J. D. Hassell has recommended betterment of fire department.

McMechen, W. Va.—Council has taken up matter of fire fighting system.

Ashland, Wis.—Special Committee has recommended purchase of combination chemical and hose wagon and erection of station.

Denmark, Wis.—Town Board is considering ways and means of furnishing reliable fire protection.

CONTRACTS AWARDED

Oakland, Cal.—Underground cable, 15 miles, for police patrol and fire alarm system, to Waterbury Co., New York, $13,415.10.

Denver, Col.—Fire hose, 900 ft., to Republic Rubber Co., Chicago Fire Hose Co. and Eureka Fire Hose Mfg. Co.

Fall River, Mass.—Auto hose and combination engine, to Pope-Hartford Co., $5,000.

New Philadelphia, O.—Supplying 1,000 ft. fire hose, to Fabric Fire Hose Co., New York, 90c. per ft.

BIDS RECEIVED

New Orleans, La.—Engine house: John O. Chisolm & Co., $7,590; the American Engineering and Construction Co., $7,469; F. A. Noullet & Son, $7,289; Michel Clessi & Co., $8,019; Robert B. Ward, $7,392.

Baltimore, Md.—Engine house, Baltimore st., R. B. Mason, lowest bidder, $24,488.

ELECTRIC RAILWAYS

Douglas, Ariz.—El Tigre Mining Co. proposes building electric railway from Douglas to El Tigre.

Fresno, Cal.—Fresno Traction Co. has applied to Board of Supervisors for franchise to build extension of line.—A. G. Wishon, General Manager.

Pomona, Cal.—Trustees have granted Geo. A. Pillsbury franchise to construct electric railroad.—T. R. Trotter, City Clerk.

San Francisco, Cal.—City will sell, May 16, 3 p. m., $260,000 Geary st. railroad bonds.

Valdosta, Ga.—Valdosta Street Railway Co. has decided to build extension and form belt line.—W. S. West, President.

Caldwell, Ida.—Caldwell-Roswell Interurban Railway has been incorporated by W. W. Dorman to build line between this place and Roswell .

Anderson, Ind.—The Indiana Union Traction Co. will soon purchase 2500-kw low-pressure turbine for its power house.—H. A. Nicholl, General Manager.

Indianapolis, Ind.—Council will take up matter of street car extensions and cross-town car line on Morris st.

Utica, Ind.—Dix Bros., of Utica, are interested in plan to build 6-mile railway to extend from Utica to Jeffersonville.

Waverly, Ia.—Waterloo, Cedar Falls and Northern Co. has been granted franchise for interurban railway; line will be extended from Denver Junction to this city.

Great Bend, Kan.—Citizens will vote May 24 on aiding Kansas Northwestern Railway in South Bend Township.

Kinsley, Kan.—Air Line Construction Co. has been chartered to build line from this city to Wichita. M. C. Tubbs, city; W. F. Brown, Naron; T. E. Luttgerding, Eldorado, and others are interested.

Turon, Kan.—Citizens have voted $12,000 bonds for construction of Wichita, Kinsley, Scott City and Denver Air Line Railroad.

Boston, Mass.—Boston Elevated Co. is considering extensions to suburban service totalling five miles and cost $10,500,000.

Detroit, Mich.—Bids will be received May 14, noon, by F. A. Bean, Chief Engineer, Lansing & Grand Rapids Ry., for all necessary surveys and plans for electric railway; length, 20 miles.

Virginia, Minn.—Council has passed ordinance giving franchise to the Prindles.

Perth Amboy, N. J.—Jersey Central Traction Co. will lay tracks at once in this city.—Edmund Wilson, Counsel.

Woodbury, N. J.—Camden, Gloucester & Woodbury branch of Public Service Railway is to be extended from this city as far as Paulsboro at once.

Muskogee, Okla.—Company has been formed to build line from this city to Tulsa, distance 50 miles; capital $100,000. E. W. Mangs and A. J. Barwick, St. Louis, are interested.

Reading, Pa.—Reading Transit Co. will relay entire 5-mile line of Lebanon-Annville line with 80-lb. rails.

Austin, Tex.—John Andrewatha has applied for street railway franchise.

Beaumont, Tex.—Col. I. D. Polk has applied for franchise to build electric street railway in connection with plan to build interurban railway from this city to Port Arthur.

Cleburne, Tex.—Daniel Hewett is interested in construction of proposed street railway.

Dallas, Tex.—H. M. Hyatt, representative of the Empire Construction Co. of St. Louis, is organizing company to build interurban railroad line from Dallas to Cleburne.

Waco, Tex.—Representing R. S. Vivian, Chicago financier, R. T. Gunn has made proposition to citizens of Waco relative to interurban between this city and Temple.

Cheney, Wash.—North Coast Railroad has been granted franchise.

Bridgeport, W. Va.—Maynard residents are urging Wheeling Traction Co. to extend line from Barton to Maynard.

Clarksburg, W. Va.—Clarksburg and Weston Electric Railway Co., Fairmont, has been chartered to build line from this city to Weston. Jas. Watson, Walter Miller, J. E. Watson, A. B. Fleming and Geo. T. Watson are interested.

Mannington, W. Va.—Council has revoked the franchises granted by old Council for street railway and lighting to Peoples Utility Co.; case is now pending in court.

Plymouth, Wis.—Milwaukee Road will rebuild two bridges in town of Rhine.

BRIDGES

Little Rock, Ark.—City will construct concrete culvert through Vance st.—F. M. Oliver, Clerk.

Nevada City, Cal.—Board of County Supervisors is considering construction of bridge across Truckee River.—B. M. M. Miller, Engineer.

Red Bluff, Cal.—Tehama County will vote on $370,000 bonds for erection of bridges instead of $60,000 as first proposed.

San Francisco, Cal.—Cost of carrying 19th st. over Golden Gate Park has been estimated at $250,000.

San Francisco, Cal.—Board of Public Works has rejected bids received March 16 for erection of Mission viaduct; new bids will be asked.

South Pasadena, Cal.—Plans have been approved for new bridge to connect Pasadena ave. in Garvanza with Pasadena ave. and Arroyo drive in this city.

Macon, Ga.—Bibb County Commissioners will issue about $500,000 of bonds for improvement of bridges and roads.

Macon, Ga.—Bibb County will issue $500,000 bonds for building bridges and roads and for other improvements.

Macon, Ga.—Council has called upon Central of Georgia Railroad to erect bridge on 2d st.

Twin Falls, Ida.—Twin Falls and Lincoln counties will erect $5,000 bridge across Senate River.

Colona, Ill.—Bids will soon be asked by County Supervisors of Rock Island and Henry counties for erection of $40,000 bridge.

Cedar Rapids, Ia.—Council has had two sets of plans prepared for construction of proposed rein. concrete bridge across river.

Fort Dodge, Ia.—County has offered city $17,000 towards construction of proposed South 3d st. viaduct.

Manhattan, Kan.—Highway Engineer Gearhart, of Agricultural College extension department, has just completed plans and specifications for seven bridges for Wabaunsee County; five of these are of reinforced concrete and range from 20 to 35 ft. spans; also plans and specifications for one 80-ft. steel bridge with concrete floor, and for steel bridge over Kaw River.

Topeka, Kan.—C. E. Denison & Co., Cleveland, has purchased $61,212.41 bridge and crematory bonds.

Winnfield, La.—Winn Parish Police Jury has appropriated $2,500 for erection of a steel bridge across Dudgemonia Bayou.

Denton, Md.—Caroline County Commissioners are considering construction of bridge over Choptank River.

Lowell, Mass.—Rebuilding Congress st. bridge has been estimated at $2,200, and rebuilding Lawrence st. bridge at $2,000; alterations in Billerica st. bridge will cost $7,800.

Grand Rapids, Mich.—Council has decided in favor of improvement of approach to the Ann st. bridge; cost $15,000.

Lindford, Minn.—Township will receive bids May 7 for $6,500 bridge and road bonds.—J. W. Skifstrom, Town Clerk.

Omaha, Neb.—Commissioners of Douglas and Saunders counties have ordered plans prepared for construction of bridge across Platte River at Valley.

Atlantic City, N. J.—Erection of bridge across Beach thoroughfares from this city to Riviera Beaches, is being considered. Major R. R. Raymond, Engineering Corps, Wilmington, Del., is interested.

Bayonne, N. J.—Board of Trade and merchants have started a movement to obtain wagon traffic bridge over Newark Bay, between this city and Elizabeth.

Newark, N. J.—Plans for new approaches to Bridge st. bridge have been ordered drawn by Joint Bridge Committee of Essex and Hudson County Boards of Freeholders; cost $30,000.

Rome, N. Y.—Board of Public Works has rejected all bids for building abutments for E. Bloomfield st. bridge and new bids will be advertised for.

Cleveland, O.—Public Service Director Lee will readvertise for bids on contract for supply of 65 tons of steel for the strengthening of Superior viaduct.

Defiance, O.—Bids will be received May 10 for $48,000 bridge bonds.

Pryor, Okla.—Mayes County Commissioners are considering issuance of $100,000 of bonds for construction of bridges over Grand River and smaller streams.

Reading, Pa.—Board of Public Works will advertise for bids for construction of bridge on roadway crossing Schuylkill at Mifflin's Arm.

Mountain View, Tenn.—Concrete arch across Preston st., to J. B. McTye.

Batesville, Tex.—Zavalla County has voted $20,000 bonds for construction of bridges and roads.

Dallas, Tex.—Citizens Committee has recommended adoption of plans by Brenneke & Fay, St. Louis, for proposed Dallas-Oak Cliff viaduct.

Houston, Tex.—F. L. Dormant, Consulting Engineer, has been instructed to prepare plans for rein. concrete viaduct across Houston ship channel at foot of Main st.—H. B. Rice, Mayor.

Colfax, Wash.—County Commissioners are considering plans for bridge across South Ualouse River.

Fairmont, W. Va.—Council is considering ordinance to bond city for $75,000 to erect bridge on 4th st. and to improve water system.

Milwaukee, Wis.—Council has acted favorably on resolution to draft ordinance for issue of $200,000 Buffalo st. bridge bonds.

CONTRACTS AWARDED

Kansas City, Kan.—Concrete culvert, Reidy rd., to F. M. Torson, $2,500.

Baltimore, Md.—Steel bridge over Gwynn's Falls to Lauer & Harper Co., Westport, Md;; cost about $5,000.

Hackensack, N. J.—Culvert on Blakely place, Garfield, to Ernest Abrahams, of this place, for $1,747; Union Bridge Construction Co., New York, $1,750; John T. Harrop, Garfield, $2,049; Colonial Engineering & Contracting Co., New York, $2,169.50; F. R. Long Co., Hackensack, $2,472.

Jersey City, N. J.—Repairing Hackensack River bridge on Plank road, to J. I. Hass, city, $3,900.

New Brunswick, N. J.—Concrete bridge over Cranberry Brook at Plainsboro, to McGovern & Hillman, city, $1,238.40.

Morristown, Tenn.—Steel bridge across Nola Chucky River to Converse Bridge Co., Chattanooga, Tenn., $5,927.

BIDS RECEIVED

Ridgway, Col.—Constructing a steel bridge across Uncompaghre River, near Ridgway, M. F. Levy Contracting Co., Denver, lowest bidder, $10,198.

Syracuse, N. Y.—Construction of reinforced concrete arched bridge over Onondaga Creek, Dickerson st., Samuel Bonn, $6,560.75; C. J. Sullivan, $8,055.25; Frank Sposata, $9,451; C. T. Hookway, $7,111.40; H. S. Moore, $10,999.70; John Young, $7,886.50; Walter Bradley, $8,280.50; Wells, Boughton & Co., $9,299.80.

MISCELLANEOUS

Birmingham, Ala.—City has advertised for bids on $400,000 bond issue. Address Mayor O'Brien.

Fort Smith, Ark.—Architect Jennings has prepared plans for erection of jail; cost of building, $8,000; cells and other equipment, $20,000.

Alameda, Cal.—Bids will be received May 17, 8 p. m., for $180,000 improvement bonds.—F. E. Browning, City Clerk.

Oakland, Cal.—Playground Commission is planning to install playgrounds in various parks.

Red Bluff, Cal.—Tehama County will vote $200,000 bonds for court house and jail instead of $60,000 as first proposed.

San Diego, Cal.—Citizens will vote May 31 on $884,000 bonds for municipal improvements and $1,000,000 for proposed fair.

San Francisco, Cal.—Public Buildings Committee has recommended acceptance of tentative plans for city hall at 8th and Mission sts.

Wilmington, Del.—Advisory Board has recommended that Council assent to building by Water Department of proposed office building at City Mills pumping station.—Chas. K. Lloyd, Secretary.

Jacksonville, Fla.—City will purchase site in East Jacksonville for park purposes.—W. S. Jordan, Mayor.

Leesburg, Fla.—Board of Trade has adopted resolution favoring bond issue for park improvements and sewerage.

Atlanta, Ga.—Improvement Committee, Park Commission, will erect $8,000 comfort station at Piedmont Park.—Harry L. Walker, Architect.

Macon, Ga.—Bibb County has decided to issue $500,000 bonds for erecting court house, building roads and bridges and making other improvements.

Robinson, Ill.—Citizens defeated proposed $10,000 improvement bond issue.

Tennessee, Ill.—Town has voted $6,000 bonds to build town hall.—H. W. Newland, Clerk.

Evansville, Ind.—Plans are being prepared for erection of combined city hall and coliseum building. Address Mayor Heilman.

Indianapolis, Ind.—George E. Kessler, landscape architect for Board of Park Commissioners, is conferring with Board on a number of park and boulevard improvements it is proposed to make this year.

Richmond, Ind.—County Commissioners have made arrangements with W. S. Kauffman & Son, architects, whereby firm will supervise construction of addition to County Jail, and dining hall, kitchen and central

heating plant at County Farm; Council has appropriated $10,000 for improvement at County Farm and $3,000 for work at jail.

Salina, Kan.—City is considering erection of city hall.

Lake Charles, La.—City hall and court house has been destroyed by fire.

Brockton, Mass.—Carnegie library will be erected if city will furnish site and maintenance fund.—W. H. Clifford, Mayor.

Haverhill, Mass.—Voters of Wards 2 and 6 are urging establishment of playgrounds.

Lawrence, Mass.—Plans have been drawn for renovating city hall to house all municipal department offices under one roof; cost $50,000.

Northampton, Mass.—Erection of city hall is being considered; cost $150,000.

Eveleth, Minn.—City Clerk will look after matter of providing street signs in new territory.

Virginia, Minn.—Health Officer Dr. J. H. Crowe has suggested that Council take up installation of garbage incinerator.

Atlantic City, N. J.—City has sold $175,000 park bonds to Gilman & Clucas and Proctor & Borden, New York.

East Orange, N. J.—Council has passed resolution to purchase site at Elmwood ave. and S. Center st., for erection of $13,000 branch library.

Gloucester, N. J.—Street Committee will purchase new sprinkler.

Dunkirk, N. Y.—Governor Hughes has signed bill providing for election on $100,000 bonds for construction of docks.—Harry James, Mayor.

Newburgh, N. Y.—Street Committee is considering purchase of auto for use of Street Superintendent Bastian.

Oswego, N. Y.—Canal Board has approved report of the Advisory Board of Engineers in regard to location of dams on Oswego River.

Asheville, N. C.—City has had plans by Nashville Bridge Co., Nashville, Tenn., for steel tower for city hall.

Akron, O.—Erection of public comfort station in downtown section of city is being considered; plans prepared.

Cleveland, O.—Council has adopted resolution calling upon City Engineer to prepare plans and estimates for straightening of lower Cuyahoga River; cost about $1,500,000.

Dayton, O.—Board of Public Service has asked for bids for construction of two garbage cars for garbage department; cost about $600 each.

Duquesne, Pa.—Contracts will soon be let for erection of $27,000 city hall at corner of 2d st. and Zeno alley.

Harrisburg, Pa.—Park Commission has decided to ask Councils for appropriation for public comfort station at Front st. entrance to Market st. bridge; Consulting Engineer Manning will be asked at once to draw plans.

Massillon, O.—Council will consider ordinance to issue $6,000 bonds for purchase of site and erection of market house.

Phœnixville, Pa.—Street Committee of North and South Districts are considering marking of streets with signs.

Toledo, O.—Director of Public Service has been authorized to advertise for disposal of garbage; period 10 years.—J. M. Babcock, Clerk of Council.

Clinton, Okla.—City will again vote on purchase of site for erection of city hall.

Sharon, Pa.—Erection of jail is being considered.—Griff Nicholls, City Engineer.

Newport, R. I.—Erection of police station on Market Square is being considered.

Chattanooga, Tenn.—Committee has been appointed to investigate construction of municipal building.

Dyersburg, Tenn.—Committee, Alderman Fumbanks, Chairman, will at once make contract for sprinkling portions of eleven streets.

Alice, Tex.—Citizens have voted $10,000 bonds for city hall.

Houston Heights, Tex.—Mayor Barker has recommended sprinkling of boulevard during summer months.

Martinsville, Va.—Henry County has had plans prepared by Huggins & Bates, Roanoke, for jail; cost $15,000.

Puyallup, Wash.—Council has passed ordinance requiring installation of public garbage cans in business district and calling for bids for city scavenger's work.

Spokane, Wash.—Special Committee has recommended establishment of two city markets.

Wheeling, W. Va.—Board of Control has estimated cost of collecting garbage under proposed system of having city take charge of work at $19,500.

Watertown, Wis.—Council will issue $4,000 bonds for laying out and equipping park in Sixth Ward.

Fernie, B. C., Can.—Citizens are considering election on following by-laws: Water extensions, $19,000; sewers, $41,000; surface drainage, $27,000; street improvements $10,000.

CONTRACTS AWARDED

Ft. Mason, Cal.—Construction of a retaining wall, to Duncanson-Harrelson Co., San Francisco, $12,200.

Torrington, Conn.—Sprinkling 7½ miles, to E. J. Kelley Co.

Boonville, Ind.—City lake, to Foster & Rainer Construction Co., Union City, $18,865.

Cedar Rapids, Ia.—Removal of garbage, to F. W. Koob, $250 per month.

Bangor, Me.—Sprinkling streets, to J. Frank Green, $10,195.95.

Boston, Mass.—Building a sea wall near Charles Eliot Circle, Revere Beach Reservation, to W. H. Ellis, of Boston, at following bid: 6,000 cu. yds. earth grading, 50c.; 1,700 cu. yds. concrete masonry, $6.50; 780 lin. ft. concrete coping, $2; total, $15,610. Totals of other bids: D. F. O'Connell & Co., city, $27,770; John J. Falvey, Somerville, $27,040; Bruno & Petitti, city, $26,260; Devincenzi & Baruffoldi, city, $21,671; Belvilacqua Construction Co., city, $21,606; Lawler Bros., Charlestown, $19,969; Luke D. Mullen, city, $18,745; Coleman Bros., city, $18,494; John E. Palmer, city, $18,168; Jas. H. Fannon, Somerville, $17,895; John Cashman & Sons Co., W. Quincy, $17,855.

Holyoke, Mass.—Auto for electric station, Gas and Electric Co., to Holyoke Automobile Co., $1,900.

Duluth, Minn.—Two sprinkling carts, to Austin Mfg. Co., Aurora, Ill., $285 each; also one sweeper from same company, $185.

Auburn, N. Y.—Auto wagon, complete, with extension box, top and magneto, to International Harvester Co., $765.

Owego, N. Y.—Building jail, to M. L. Bauer, city, $34,987.

Philadelphia, Pa.—Summer uniforms, park guards, to N. T. Lewis & Son; coat, vest and trousers, $11.77; trousers for mounted officers, $5.77; gloves, $1.77, and uniforms for bicycle guards, $16.77.

Alpine, Tex.—Hauling garbage, to J. T. Weaver & Son, $3.50 per day.

Dallas, Tex.—Auto patrol wagon, to Webb Motor Fire Apparatus Co., $3,500.

BIDS RECEIVED

Bangor, Me.—Street sprinkling, (a) American Car Sprinkler Co., Worcester, Mass.; (b) J. Frank Green; (c) Geo. A. Daley; Streets 15-20 ft. wide, (a) 5c. per lin. ft., (b) 5¼c. per lin. ft., (c) 3½c. per lin. ft.; streets 20-23 ft. wide, (a) 6c. (b) 6¼c. (c) 4½c.; streets 23-25 ft. wide, (a) 7c. (b) 7¼c. (c) 5c.; streets 25-27 ft. wide, (a) 8½c. (b) 8½c. (c) 6½c.; streets 27-29 ft. wide, (a) 9c. (b) 9¾c. (c) 7½c.; streets 29-34 ft. wide, (a) 10c. (b) 10½c. (c) 8c.; streets 34-39 ft. wide, (a) 10½c. (b) 11½c. (c) 8½c.; streets 39-42 ft. wide, (a) 13c. (b) 12½c. (c) 9½c.; streets 42-45 ft. inclusive, (a) 16¾c. (b) 15¼c. (c) 10c.; streets 55-60 ft. wide, (a) 17c. (b) 16¾c. (c) 10c.

Burlington, N. J.—City hall: Stewart L. Maines, Moorestown, including plumbing and heating, $19,426; alterations and additions not included, John J. Norcross, $11,252; James Lanning, Burlington, $12,668; J. E. Kolster, Willingboro, $10,357.60; Shanner & Miller, Edgewater Park, $11,580.45; M. P. Murphy, Philadelphia, $12,770.

West Point, N. Y.—Garbage crematory (a) Construction building proper; (b) crematory with steel stack; (c) crematory with brick stack; (d) building and crematory with steel stack, complete; (e) building and crematory with brick stack, complete: Morse-Boulger Destructor Co., 39 Cortlandt st., New York City, (a) $2,700, (b) $2,900, (d) $5,600; Lewis & Kitchen, Kansas City, Mo., (a) $3,100, (b) $3,585, (c) $4,785, (d) $6,685, (e) $7,885; Dixon Engineering and Construction Co., Toledo, O., (a) $4,325, (b) $4,724, (c) $6,164, (d) $9,024, (e) $10,464; E. A. Matthews, 13 Park Row, New York City, (a) $4,000; Alamo Construction Co., 215 W. 125th st., New York City, (a) $3,250, (d) $10,500.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Aurora, Ill.—Specifications are being prepared by City Engineer Myron J. Tarble for about 25,000 sq. yds. asphalt paving for three streets.

Hammond, Ind.—Lake County Board of Commissioners will construct three macadam roads in this city.

Mishawaka, Ind.—Preliminary plans are being prepared by City Engineer James Haverly for paving Mill st.—Jas. L. Kennedy, Clerk, Board of Public Works.

South Bend, Ind.—New bids will be asked for grading La Salle ave.; plans have been approved for grading South Scott st.—O. C. Bastian, Chairman, Board of Public Works.

Wichita, Kan.—Engineer C. A. Messer, Sedgwick County, has prepared preliminary surveys for 9 miles of sand clay road; cost $7,000.—J. L. Leland, County Clerk.

New Orleans, La.—Council has adopted ordinances for paving Magazine st. and instructing City Engineer to prepare plans and award contract for resurfacing with asphalt, including subsurface work, Elmira st.

Lowell, Mass.—Council has ordered sidewalks constructed on nine streets.

Detroit, Mich.—Council has directed Department of Public Works to advertise for bids for paving streets as follows: Ferry ave., with sheet asphalt, cost $11,675; Lafferty pl., cedar blocks, $1,820, and Lyman ave., cedar, $1,088.—J. J. Haarer, Commissioner.

Highland Park, Mich.—Citizens have voted proposition to issue $89,000 bonds for repairing Woodward Ave.

Crookston, Minn.—Street and Bridge Committee is favorable to asphalt paving on Houston ave.

Warrensburg, Mo.—City will construct nearly four miles of street improvement this summer; estimate and plans will be made soon.—H. W. Sanders, City Engineer.

Libby, Mont.—Engineer Paul D. Pratt is preparing specifications for proposed improvement district; about 4½ miles of cement sidewalk will be laid.

Bethlehem, N. H.—Town will expend about $12,000 on roads this year; contract will be let at once for macadamizing Main st.; cost $7,000.

Fostoria, O.—Plans have been prepared by City Engineer Charles Latshaw for 3,500 ft. of paving on N. & S. Union sts.

York, Pa.—Council is considering paving of two streets with bitulithic; Highway Committee has approved ordinance for improving portions of eight streets and one alley.

Dodgeville, Wis.—Committee on Streets has recommended construction of cement sidewalks.

Maison, Que., Can.—Council has appropriated $600,000 for macadamizing street grading and sewers.

CONTRACTS AWARDED

Pasadena, Cal.—Grading and improving Holleston ave. to M. L. Curtis, South Pasadena, $5,113.80.

Marysville, Ky.—Sidewalks: Four streets to Brawley Bros., Portsmouth, O., 13½c. per sq. ft.; two streets to Hord & Evans, 13½c. per sq. ft.; 4th st. to John Hays, 12c. per sq. ft.

Dayton, O.—Xenia ave., asphalt, to Letels Bros., $20,568; brick, to John Wroe, $4,719.

Dayton, O.—Furnishing eight carloads of asphalt to California Asphalt Co., $28 per ton.

Salt Lake City, Utah.—Sidewalk extension No. 136 to J. D. Hanley, $25,070.

SEWERAGE

DeKalb, Ill.—City has had plans prepared for proposed system of sewers.

Murphysboro, Ill.—City is considering constructing six miles of sanitary sewers.—George Kennedy, City Engineer.

Valparaiso, Ind.—City Engineer G. F. Stinchfield has prepared preliminary plans for vitrified pipe sewers in various streets.—C. H. Heim, Clerk Board of Public Works.

Humboldt, Kan.—City has selected J. S. Worley Co., 206 & 207 Reliance Bldg., Kansas City, Mo., to prepare plans and specifications for system of sewers and sewage purification plant; cost between $75,000 and $80,000.

Warrensburg, Mo.—Plans are being prepared for district sanitary sewers and septic tank.—H. W. Sanders, City Engineer.

Woodbury, N. J.—City will be compelled to provide sewage disposal plans for new sections.—Wm. Carter, City Engineer.

Wooster, O.—Council is considering construction of 12-in. sewer on Quinby ave.

Susquehanna, Pa.—Consulting Engineer F. H. Shaw, Wanner blk., Reading, is preparing plans for about 2,000 ft. of vitrified tile pipe sewer.

Williamston, S. C.—City is considering election on bonds for construction of sewer system.

Commerce, Tex.—Sewer Co.'s Engineer has completed preliminary survey for pro-

(*Continued on page 689*)

BIDS ASKED FOR

State	City	Received Until	Nature of Work	Address Inquiries to
			STREET IMPROVEMENTS	
New York	Troy	May 6	Repairing asphalt pavement on several streets	Jas. H. Riley, Sec'y Bd. Cont. & Sup.
Connecticut	Bridgeport	May 6	Paving Stratford ave. with wood block, brick on steep grade	M. F. McKenna, City Engineer.
Iowa	Iowa City	May 6	Paving Jefferson st	O. J. Slatter, City Clerk.
Indiana	Indianapolis	May 6	Grade, gravel, etc., Eastern Ave	C. A. Schrader, Pres. Bd. Pub. Wks.
Pennsylvania	York	May 6	Paving, brick and bitulithic, North Duke street	S. W. Bahn, Chm. Hwy. Com.
Ohio	Cincinnati	May 6, noon	Grade, pave, etc., Beechwood ave.; also intersection	John J. Weaver, Clk. Bd. Pub. Serv.
Ohio	Youngstown	May 6, noon	Laying and repairing stone and cement sidewalks and cross-walks; also grading Green st	W. H. McMillen, Clk. Bd. Pub. Serv.
Ohio	Toledo	May 6, noon	Brick paving, limestone curb, grading, drains, inlets, etc., Beechwood ave.; also bldg. retaining wall on Butler and E. Fourth sts., and paving intersections with granite block	John J. Wenner, Clk. Bd. Pub. Serv.
New Hampshire	Concord	May 6, 1 p.m.	Bldg. trap road to cost $2,100, also 6 miles native stone road, at Wilton; $29,000 native stone road at Winchester; 3 miles native stone road at Holderness	H. C. Hill, State Engineer.
North Dakota	Grand Forks	May 6, 2 p.m.	Grading and repaving 4 miles of County road n.w. of city	Hans Anderson, County Auditor.
Pennsylvania	Dormont	May 6, 8 p.m.	Brick paving, 1,900 sq. yds.; concrete curb and gutter, 2,000 lin. ft.; grading, 4,000 cu. yds. Douglass & McKnight, 709 Union Bank Building, Pittsburg., Engineer	Hugh M. Stilley, Chm. St. Com.
Indiana	Lafayette	May 6, 11 a.m.	Constructing gravel road in Wabash township	J. P. Foresman, County Auditor.
New York	Albany	May 6	Improving Road No. 70, in Lewisboro, Westchester Co., 3.85 mi.	S. Percy Hooker, Chm. St. Hwy.Com.
Florida	Palatka	May 7, 11 a.m.	Bldg. hard-surfaced road, 10 miles long, to San Mateo	S. Worden, Sec'y Co. Bond Trus.
Minnesota	Hinckley	May 8, 8 p.m.	Bldg. all street crossings ordered during year	J. M. Currie, Village Recorder.
Illinois	Joliet	May 9, 10 a.m.	Laying cement concrete sidewalk on Richard st	Wm. S. Welch, Clk. Bd. Loc. Imp.
Illinois	Elgin	May 9, 10 a.m.	Vit. brick paving on 5-in. concrete base, comb. concrete curb and gutter, etc., Walnut ave.; also railroad portion	Albert Fehrman, Pres. Bd. Loc. Imp.
Ohio	Steubenville	May 9, noon	Grading, sewering, macadamizing Bloomfield Western tpk	L. B. Talbot, Chm. Co. Comrs.
Maryland	Annapolis	May 9, noon	Laying curb and Revell st	J. C. Little, City Engineer.
Ohio	Toledo	May 9, noon	Grading and paving Auburn ave.; also sidewalks	Fred. Shane, Sec'y Dir. Pub. Serv.
Ohio	Cleveland	May 9, noon	Paving Connell road at Nickel Plate R. R. crossing	A. B. Lea, Director Pub. Service.
New Jersey	Newark	May 9, 3:30 p.m.	Furn. 1 1-2-in. broken stone and dust trap rock, all roads	Geo. W. Eager, Chm. Bd. Freehold'rs
Indiana	Long View	May 9, 7 p.m.	Vit. brick st. and alley cross., cement walk, Wabash ave	H. R. Tinsley, Clk. Bd. Trus.
Montana	Missoula	May 9, 5 p.m.	Bldg. all sidewalks and curbs during 1910; also for macadam, concrete curb and crossways, culverts, etc. Dists. 3, 4 and 5	W. A. Logan, City Clerk.
South Dakota	Aberdeen	May 9, 8 p.m.	Curbing 4 streets with stone, granite or cement	F. W. Raymond, City Auditor.
Michigan	Detroit	May 9	Furn. road oil, rock asphalt, cement, etc., f. o. b. Detroit	M. P. Hurlbut, Comr. of Parks.
North Dakota	Bathgate	May 10	Laying 7,500 ft. cement walks on Asylum Grounds	Bd. Trus., Asylum for Blind.
Ohio	Columbus	May 10	Imp. Hess pike, 7.2 miles, with crushed limestone	H. K. Lindlay, Co. Surveyor.
Maryland	Denton	May 10, noon	Grading and macadamizing 0.61 mile Bridge st., Federalsburg	J. L. Dukes, Clk. Co. Comrs.
New York	New Br'ton, S. I.	May 10, noon	Furn. and deliver broken stone and screenings	George Cromwell, Boro. Pres.
Ohio	Cincinnati	May 10	Wood block paving portion of Ohio ave	John J. Weaver, Clk. Bd. Pub. Sevr.
Ontario	Beith	May 10	Constructing 8 miles of macadamized road	And. Coffey, Mayor of Elgin.
Texas	Abilene	May 10	Paving to cost $150,000, on 7 specifications, with concrete and crushed rock, including vit. brick, bitu. granitoid	The Mayor.
North Carolina	Winston-Salem	May 10, 10 a.m.	Constructing 4 miles of macadam road	J. L. Ludlow, Engineer.
Washington	Olympia	May 10	Grading, draining, macadamizing, etc., 3 State aid roads	Henry L. Bowlby, Sec'y St. Hwy. Bd
Oklahoma	Ardmore	May 10, noon	Improving First ave., S. W., Imp. Dist. No. 7	G. H. Bruce, City Clerk.
Wisconsin	Janesville	May 10, 2 p.m.	Brick paving, 7,175 sq. yds. So. Main st.; asphalt macadam, 7,630 sq. yds., S. 3d st.; macadam, 3,600 yds.; also paving 2 sts.	W. F. Carle, Chm. St. Assess. Com.
Pennsylvania	Nanticoke	May 10, 7:30 p.m.	Telford macadam, 2,000 ft. East Main st	David H. Samuel, Boro. Engr.
Ohio	Columbus	May 11	Grading and macadamizing 2 roads, 3,705 and 7,420 ft. long	John Scott, Chm. Co. Comrs.
New York	Port Jervis	May 11	Vit. brick paving, 11,000 sq. yds, 3 streets	John F. Clear, City Clerk.
Wisconsin	Fond du Lac	May 11	Grading, cement paving with 5-yr. guar., const. curb and gutter	J. S. McCullough, Chm. Bd. Pub. Wk.
New York	Brooklyn	May 11, 11 a.m.	Grading and paving various streets	Alfred E. Steers, Boro. President.
Ohio	Warren	May 11, 1 p.m.	Bldg. 6.8 miles macadam road	Glen W. Perkins, Road Dist. No. 1.
Ohio	Chillicothe	May 12	Laying sidewalks on Mulberry st	H. M. Redd, City Engineer.
New York	Brooklyn	May 12, 3 p.m.	Repairing asphalt and block paving, furn. gravel, etc.	Park Board, N. Y. City.
North Carolina	Washington	May 12, 7 p.m.	Improving 6 sts. and 1 alley, 6,130 lin. ft., inc. grading, curb, gutter, bit. macadam or brick paving, cement walks, etc.	D. B. Packard, City Engineer.
New Jersey	Newton	May 12	Grading and macadamizing road in Sandyston twp	A. H. Konkle, County Engineer.
Indiana	Brookville	May 12, noon	Bldg. gravel road on line between Salt creek & Metamora twps.	Charles A. Miller, County Auditor.
Ohio	Cincinnati	May 13, noon	Improving Conroy road in Sycamore township	Fred Dreihs, County Clerk.
Missouri	St. Louis	May 13, noon	Improving various roads in city	W. B. Dryden, Sec'y Bd. Pub. Impts.
Texas	Waco	May 13, 9 a.m.	Laying permanent pavements in 1 st. and 2 alleys	H. Bleistrot, Mayor.
Ohio	Delaware	May 14, noon	Constructing 4 county roads	W. H. Whittier, County Surveyor.
Wisconsin	La Crosse	May 14	Grading, curbing and improving various streets	Jas. T. Day, Chm. Bd. Pub. Wks.
South Dakota	Redfield	May 14, noon	Grading 8 miles of road in Jefferson twp	A. W. Young, Clk. Co. Superv.
Nebraska	Omaha	May 14, noon	Laying 1,300 lin. ft. concrete paving	D. M. Haverly, County Clerk.
Minnesota	Plummer	May 14	Removal of 8,000 yds. of dirt for road work	R. H. Green, Superv. Tn. of Equality
Ohio	Cleveland	May 14, 11 a.m.	Paving Herbst road with Medina block stone	Frank R. Lander, County Surveyor.
Arkansas	Little Rock	May 14, 4 p.m.	Asphalt paving, W. Sixth and Victory sts	E. A. Kingsley, Supt. Pub. Wks.
Indiana	Plymouth	May 15	Constructing 24,230 ft. gravel road in Walnut township	Commissioners of Mardrack Co.
Ohio	Youngstown	May 15	Brick paving, 10,000 sq. yds. on concrete base with cement filler, 4,000 lin. ft. curb, 1,800 cu. yds. excavation	F. M. Lillie, City Engineer
New Jersey	Westfield	May 16, 8:15 p.m.	Street improvements, sewers, etc.; A. W. Vars, Town Surveyor.	Lloyd Thompson, Town Clerk.
Indiana	Hammond	May 16, 10 a.m.	Laying 5-ft. cement sidewalks; 2 jobs	A. R. Ebert, Pres. Bd. Pub. Wks.
Texas	Galveston	May 16	Grading and paving 18 miles Co. road, rock, gravel, mudshell	John M. Murch, County Auditor.
Washington	Blaine	May 16	Paving, any suitable material, 6 blocks, Wash. st., with sewer, $50,000	H. W. Troutman, C.E., Bellingham.
New Jersey	Paterson	May 17	Paving, 28,000 sq. yds., 3 sts., asphalt, asph. macadam, wood	
Washington	Olympia	May 17	Grading, draining, macadamizing State Aid road No. 71	H. L. Bowbly, Sec'y State Hwy. Bd.
New Jersey	Paterson	May 17, 3 p.m.	Paving Park ave., 28,000 sq. yds. with asphalt, asphaltic macadam, Hassam pavement, wood block or Medina block	H. J. Harder, City Engineer.
New Jersey	Elizabeth	May 18, 2:30 p.m.	Bldg. road, 2.388 miles long, 16 ft. wide, in Rahway, of Amicsite, asphalt, macadam, or other material; excav., 27,910 cu. yds.; macadam, 22,880 sq. yds.; also 16-ft. road, 2.465 miles long; 32,374 cu. yds. excav.; 23,900 sq. yds. macadam	H. Krouse, Chm. Co. Road Com.
Pennsylvania	Harrisburg	May 19, 2 p.m.	Constructing 5.67 miles macadam roads	J. W. Hunter, State Hwy. Comr.
Missouri	St. Louis	May 19, noon	Improving a number of streets	W. B. Dryden, Sec'y Bd. Pub. Imp.
Ohio	Bellefontaine	May 19, noon	Pave, curb, grade, etc., South Main st	Paul O. Bach, Clk. Bd. Pub. Serv.
Ohio	Cincinnati	May 20, noon	Imp. Hammel road, Biddinger pike; oil Blue Rock pike	Stanley Struble, Pres. Co. Comrs.
Indiana	Goshen	May 21	Vit. wood or sandstone block paving, 21,240 sq. yds	C. C. Witt, City Engineer.
Dist. Columbia	Washington	May 23	Furn. all paving and sewer material for next fiscal year	C. H. Rudolph, Chm. Bd. Comrs.
Indiana	Jefferson	May 23, 11 a.m.	Bldg. 26,489 ft. crushed stone road in 3 counties	Peter Nachand, County Auditor.
Indiana	Kentland	May 23, 2 p.m.	Constructing system of stone roads in Washington twp	E. R. Bringham, County Auditor.
Indiana	Terre Haute	May 23, 11 a.m.	Bldg. gravel road in Honey creek and 3 in Fayette twp	N. G. Wallace, County Auditor.
Wisconsin	De Pere	May 23	Finishing work on George St. pavement	City Clerk.
Missouri	Bethany	May 25	Vit. block paving, curbing, etc., 5 blocks	J. B. McClure, City Clerk.
Indiana	Valparaiso	May 27	Bldg. 41 blocks cement sidewalk	G. F. Stinchfield, City Engineer.
California	Long Beach	May 30	Paving Railway, American and Appleton streets	Board of Public Works.
West Virginia	Princeton	June 8	Macadam, tar or asphalt macadam or bitulithic paving; 3 mi.	F. R. VanAntwerp, Chief Engineer.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO

SEWERAGE

Ohio	Cincinnati	May 6, noon	Bldg. main and lateral sewers in Beechwood ave.	J. J. Wenner, Clk. Bd. Pub. Serv.
Ohio	Youngstown	May 6, noon	Constructing sewer in portion of Cypress st.	W. H. McMillin, Clk. Bd. Pub. Serv.
North Dakota	Mandan	May 9	Constructing a sewer system; R. E. Wickham, C.E., Gr. Forks.	Lee Nichols, City Auditor.
Oklahoma	Madill	May 9	Bldg. sewer system; plans by S. W. Eng. Co., Okla. City	J. S. Dillingham, Town Clerk.
Maryland	Annapolis	May 9, noon	Connecting property with city sewer; 13 jobs.	J. C. Little, City Commissioner.
Michigan	Menominee	May 9, 5 p.m.	Bldg. sewers in Mich. ave., Ingalls and Myrtle sts.	Fred S. Norcross, City Clerk.
Iowa	Waukon	May 9, 7:30 p.m.	Bldg. 4,035 ft. 15-in., 2,320 ft. 12-in., 5,076 ft. 10-in., 11,228 ft. 8-in. vit. pipe sewer, 52 manholes, 4 flush tanks, 1 conc. protection bulkhead at outlet, nine-septic-tank disposal plant, etc	C. M. Stone, City Clerk.
Illinois	Chicago	May 10, 11 a.m.	Laying tile pipe sewers and drains, various sts.	C. A. V. Standish, Sec. Bd. Loc. Imp
Illinois	North Chicago	May 11	Grading site of sewage disposal plant; 40,000 cu. yds. excav.	Bureau Navigation, Navy Dept., Washington, D. C.
New York	Binghamton	May 11	Constructing sewer in James st.	John A. Giles, City Engineer.
Maryland	Baltimore	May 11, 11 a.m.	Furn. and erect. mechanical and electrical equipment for sewage disposal works at Back river.	Peter Leary, Jr., Pres. Sewer Comn.
Ohio	Chillicothe	May 12	Bldg. storm water sewers in 2 streets.	H. M. Redd, City Engineer.
Ohio	Cincinnati	May 13, noon	Bldg. main and lateral sewers and drains, 3 streets.	John J. Wenner, Clk. Bd. Pub. Serv.
Arkansas	Morrillton	May 16	Bldg. 3.5 miles sanitary sewer and septic tank.	Lund & Hill, Engrs., Little Rock.
New Jersey	Westfield	May 16, 8:15 p.m.	Bldg. sanitary sewers, etc.: 11,600 ft. 8-in. vit. pipe; 60 ft. 8-in. c. i. pipe; 21 manholes; 460 branches; 10 combined flush tanks and manholes; 3 drop and 10 extension connections; A. W. Vars, Surveyor.	Lloyd Thompson, Town Clerk.
Minnesota	Brainerd	May 16	Bldg. lateral sewer, Dist. No. 1.	V. N. Roderick, City Clerk.
Missouri	St. Louis	May 17, noon	Bldg. first section Bedin sewer: 475 ft. 18.5x38 ft., 2,591 ft. 17x23 ft., 1,634 ft. 13x18 ft. sewer; deposit, $6,625.	M. Reber, Pres. Bd. Pub. Impts.
New Jersey	Bridgeton	May 17, noon	Furn. all material and labor for bldg. 32 miles 8 to 24-in. vit. pipe sewers, etc., sewage disposal works, pumping station, etc. Clyde Potts, Engr. See "Proposals" ads., May 4, issue.	Jacob B. Jones, City Clerk.
New Jersey	Paterson	May 17, 4 p.m.	Constructing Lake View sewer: 2,660 ft. 36-in., 1,140 ft. 30-in., 2,500 ft. 24-in., 1,400 ft. 18-in., 1,600 ft. 15-in., 1,300 ft. 10-in. pipe; 6,800 ft. 6-in. house connections, etc.	H. J. Harder, City Engineer.
North Carolina	Sanford	May 17	Constructing 7 miles pipe sewers, 8 in. to 20 in.	T. L. Chisholm, Mayor.
Mississippi	Belzoni	May 17, 8 p.m.	Constructing system of house sewers: 3 or 4 miles 8 and 10-in. pipe, with centrifugal pump and motor; W. G. Kirkpatrick,	
Ohio	Bellefontaine	May 19, noon	Bldg. sewers and flush tanks in South Main st.	Paul O. Bach, Clk. Bd. Pub. Serv.
			Jackson, Engineer.	Mayor and Aldermen.
Pennsylvania	Hazleton	May 20, 7 p.m.	Completing sewer work unperformed by Geo. H. Meinholz.	A. H. Ringlaben, Pres. Boro. Council.
Kansas	St. John	May 20	Bldg. complete sanitary sewer system, inc. disposal plant. Burns & McDonnell, Engrs. See "Proposal" ads.	A. O. Seevers, City Clerk.
Ohio	Cleveland	May 21, 11 a.m.	Furnishing sewer pipe, etc., for Cuyahoga County.	J. F. Goldenbogen, Clk. Co. Comrs.
New Jersey	Perth Amboy	May 21, 8:30 p.m.	Constructing 12-ft. sewer in Baker Place.	Geo. M. Adair, Street Comr.
South Dakota	Aberdeen	May 23	Bldg. 5,000 ft. 10-in., 600 ft. 12-in. pipe sewers; 13 manholes.	F. W. Raymond, City Auditor.
Arkansas	Searcy	May 25, 3 p.m.	Furn. material and bldg. sanitary sewer system: 2,800 ft. 15-in., 2,700 ft. 12-in., 2,070 ft. 10-in., 17,960 ft. 8-in., 12,150 ft. 6-in. tile pipe sewers; 125 manholes; 10 flush tanks, and sewage purification works of concrete tank, ejector station and filter. W. S. Shields Eng. Co., Hartford Bldg., Chicago.	E. A. Robbins, Chm. Bd. Pub. Imp
Ohio	Cleveland Hts.	May 24, noon	Labor and material for bldg. sewers in Cedar road.	H. H. Canfield, Village Clerk.
Missouri	St. Louis	May 24, noon	Bldg. first section So. Harlem Joint District Sewer, mostly 16x12 ft. 9 3-4 inches, reinforced concrete, 6,488 ft. long, etc.; deposit, $5,746.	M. Reber, Pres. Bd. Pub. Impts.
Dist. of Col'bia	Washington	May 26	Furnishing vit. sewer pipe, Isthmian Canal Commission.	Capt. F. C. Boggs, Canal Comn.
Missouri	St. Louis	May 31, noon	Bldg. second section So. Harlem Sewer: 2,920 ft. 14x11 1-4 ft., and 4,031 ft. 12x9 3-4 ft., rein. concrete, and 1,042 ft. 7.5 ft. and 100 ft. 7-ft. brick sewer, etc.; deposit, $5,529.	M. Reber, Pres. Bd. Pub. Impts.
West Virginia	Princeton	June 8, noon	Constructing sanitary sewers and appurtenances.	F. R. Van Antwerp, Chief Engr.

WATER SUPPLY

Ohio	Youngstown	May 6, noon	Furn. and erect overflow pipe for standpipe.	W. H. McMillen, Clk. Bd. Pub. Serv.
Michigan	Saginaw	May 6, 7:30 p.m.	Furn. c. i. pipe, specials, hydrants and valves for 1910.	David C. Bell, Clk. Water Board.
Illinois	Aurora	May 6	Casing 8-in. deep well, 2,250 ft; 16-in. to 200 ft.	T. D. Stinson, Supt. Water Works.
Minnesota	Caledonia	May 7	Furn. f. o. b. city, double-action pump head, pump rods, well pump, 20 h.p. stationary pumping engine.	Chas. A. Dorival, Village Clerk.
Georgia	Ft. Oglethorpe	May 9	Constructing water distributing system.	Capt. Geo. Vidmer, Constr. Q. M.
Oklahoma	Ft. Sill	May 10, 10 a.m.	Installing water distributing system.	Capt. David Stone, Constr. Q. M.
Illinois	Chicago	May 10, 11 a.m.	Laying water supply and service pipes, various streets.	C. A. V. Standish, Sec. Bd. Loc. Imp.
New York	Brooklyn	May 11, 2 p.m.	Furn. and laying high pressure mains, etc., in Boro.	H. S. Thompson, Comr. W., G. & E.
New Jersey	Glen Gardner	May 14, 3:30 p.m.	Drilling 8-in. artesian well, cap. 75,000 gals. per 24 hours.	W. S. Jones, Pres. N. J. Sanitarium.
Kansas	Lincoln Center	May 16	Furn. equipment for water and light plant; see "Lighting"	City Clerk.
Connecticut	New Britain	May 17, noon	Bldg. 3,000,000-gal. reservoir on high land within city limits; also laying 3 miles 20 to 12-in. heavy c. i. high-pressure piping, with valves and hydrants. Percy M. Blake, Ch. Engr.	H. Dayton Humphrey, Chm. W'r Bd.
Alabama	Gadsden	May 18, 5 p.m.	Rebldg. pumping station and settling basin of w.w. plant; cost, $50,000; J. N. Hazlehurst, Atlanta, C. E.	Wilbur Hill, City Engineer.
New Jersey	Perth Amboy	May 18, 8:30 p.m.	Furn., complete, in place in pumping station, two 200 h.p., 175 lbs steam pressure water tube boilers, brick work, etc.	Board of Water Comrs.
Kansas	Ft. Riley	May 18, 10 a.m.	Taking up and relaying 10,000 ft. water pipe line, furn. & laying 5,000 ft. new 6-in. c. i. water main and making connections at Maneuver Camp.	Capt. Whitman, Constr. Q. M.
California	Oakland	May 18, 11 a.m.	Bldg. Sec. 3 of pipe system of high pressure fire system; commence work in 45, complete 120 days; $7,500 surety.	W. B. Fawcett, Sec'y Bd. Pub. Wks.
Alabama	Gadsden	May 18	Furn. 3,000,000-gal. pump, remodeling filter basins, and reconstructing bldgs.; Hazlehurst & Anderson, C.E.	W. T. Murphree, Mayor.
New York	Niagara Falls	May 20	Constructing filtration plant.	W. D. Robbins, Water Engineer.
Connecticut	Waterbury	May 20	Bldg. $300,000 concrete dam in town of Morris.	R. A. Cairns, City Engineer.
Arkansas	Searcy	May 25, 8 p.m.	Material and labor for W. W. system: 1,320 ft. 10-in., 3,400 ft. 8-in., 39,400 ft. 6-in., 830 ft. 4-in. c. i. main; 65 hydrants, three 10-in., four 8-in. and forty-four 6-in. valves with boxes; also pump room, 60,000-gal. el. steel tank, concrete surface reservoir, artesian well, deep well pump, cent. force pumps and 75 k.w. engine, and generator, etc., complete. W. S. Shields Engineering Co., Hartford Building, Chicago, Ill.	E. A. Robbins, Chm. Bd. Pub. Imp.
Oklahoma	Medford	May 26	Furn. material for water and light plant; see "Lighting"	City Clerk.
Maryland	Leslie	June 1	Bldg. 100,000-gal. clay-lined reservoir, furn. c. i. pipe, etc.	G. A. M. Johnson.
Florida	Jacksonville	June 6	Bldg. 3,000,000-gal. covered rein. concrete reservoir.	R. N. Ellis, Supt. Water Works.
Michigan	Detroit	June 14, noon	Erecting engine-room super. at new pumping station.	Benj. F. Guiney, Sec'y Water Bd.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
BRIDGES				
Pennsylvania	Ephrata	May 6, noon	Bldg. 65 ft. span cement bridge, 20-ft. roadway	F. H. Shaw, Care of County Comrs'
Missouri	Savannah	May 6	Bldg. 8 steel bridges and 7 conc. culverts	J. O. Schnitzius, County Hwy. Engr.
Pennsylvania	Lancaster	May 6	Bldg. conc. or steel bridge over creek in W. Earl twp.	N. F. Eshleman, County Controller.
Ohio	Steubenville	May 6, 1 p.m.	Bldg. sub. and superstructure, bridge No. 26, Isl. Crk. twp.	County Auditor.
West Virginia	Elkins	May 6, 3 p.m.	Bldg. bridge over Cheat river: rein. concrete, steel with concrete or stone abutments, or steel on abutments in place	F. A. Rowan, County Clerk.
Iowa	Cedar Rapids	May 7	Bldg. rein. concrete bridge over Cedar river, at 3d ave.: 6 spans, 96 ft. each, 48 ft. roadway with two 8-ft. walks; cost $13,000	Percy P. Smith, City Engineer.
Manitoba	Ellice	May 7	Bldg. bridge over Assiniboine river	Henry Tillman, Secy.-Treas.
Ontario	Peterborough	May 7, noon	Bldg. steel super. of bridge; also abutments	John E. Belcher, County Engineer.
Ontario	Plattsville	May 7, 2 p.m.	Bldg. 125-ft. steel bridge, with concrete abutments; also 30-ft. reinforced concrete arch near city	F. J. Ure, Woodstock, Co. Engr.
New Jersey	Camden	May 9, 11 a.m.	Bldg. concrete culvert over Great Egg Harbor river	J. I. Albertson, County Engineer.
North Dakota	Lisbon	May 9, 2 p.m.	Bldg. corrugated steel culverts during year	Thos. Gilbertson, Chm. Co. Comrs.
Oregon	Eugene	May 9, 2 p.m.	Bldg. wooden, also steel bridge at Cottage Grove	E. U. Lee, County Clerk.
Indiana	Kokomo	May 10	Bldg. 2 spans, 75 ft. each, rein.-concrete bridge	Wm. Ehrman, County Engineer.
Louisiana	Shreveport	May 10	Bldg. $30,000 bridge over Red river	C. G. Reeves, City Controller.
Ohio	Cleveland	May 11, 11 a.m.	Bldg. concrete bridge, also concrete culvert and conduit	Frank R. Lander, County Surveyor,
Pennsylvania	Wilkes-Barre	May 11, 2 p.m.	Building 29 bridges, Luzerne County	Jas. M. Norris, County Controller.
Indiana	Rockport	May 12, 2 p.m.	Bldg. bridges; also concrete culvert for County	John T. White, County Auditor.
New York	Jamestown	May 14	Bldg. 2 rein.-concrete bridges	Board Estimate and Review.
Ohio	Cleveland	May 14, 11 a.m.	Bldg. embankment, Barrett road, Olmstead twp.	Frank R. Lander, County Surveyor.
Nebraska	Omaha	May 14, noon	Erecting two 150-ft. steel spans	W. M. Haverly, County Clerk.
Pennsylvania	Danville	May 14, noon	Bldg. 4 steel bridges with concrete floors: 75x16 ft., 46x14 ft., 37x14 ft. and 21x14 ft.	Horace C. Blue, County Clerk.
Illinois	No. Chicago	May 14, noon	Bldg. concrete arch bridge at Naval Training Station	Bureau of Navigation, Navy Dept., Washington, D. C.
Michigan	Ypsilanti	May 16, noon	Bldg. 3-arch rein. concrete bridge over Huron river, 225 ft. long, 46 ft. wide, over all	S. Damon, City Clerk.
Indiana	Danville	May 17, 10 a.m.	Constructing 10 bridges	H. Nichols, County Auditor.
Texas	Cameron	May 18	Building steel bridge, San Gabriel River	Commissioners Court.
Ohio	Cincinnati	May 20, noon	Bldg. culverts and changing cour e of creek	Fred Dreihs, County Clerk.
Ohio	Cleveland	May 21, 11 a.m.	Bldg. 3 concrete bridges, new abutments for one	J. F. Goldenbogen, Clk. Co. Comrs.
Ohio	Niles	May 23, 1 p.m.	Bldg. sub. and superstructure, bridge, Park ave. extension	F. T. Stone, County Auditor.
Pennsylvania	Oil City	May 24	Removing old bridge and bldg. Petroleum bridge: 2 masonry abutments and 3 piers with concrete bases; also super.: plate girder span 80 ft. long, 3 steel truss spans, each 347 ft. long; approaches, 51 ft. and 146 ft. long; 30 ft. roadway and two 7-ft. walks	Board of County Commissioners.
Ohio	Cleveland	May 25, 11 a.m.	Bldg. concrete arch, Bedford extension Columbia road	F. R. Lander, County Surveyor.
Louisiana	Gretna	June 1	Constructing steel bridge over canal in Jefferson Parish	E. M. Hubert, Sec'y Police Jury.
Utah	White Rocks	June 1	Bldg. substructure of $18,000 steel bridge at Vintah and Ouray Indian agency. M. J. Patterson Constr. Co., Denver, Colo., has contract for superstructure	Com'r Indian Affairs, Wash., D. C.
Illinois	Stronghurst	June 4, noon	Building 3 bridges	P. A. Stamp, Township Clerk.
Indiana	Crown Point	June 6	Bldg. rein. concrete bridge in town of Lowell	C. A. Johnson, County Auditor.
Indiana	Hammond	June 6, noon	Bldg. steel lift bridge over Great Calumet river	C. A. Johnson, County Auditor.
Indiana	Valparaiso	June 7	Bldg. 2 township bridges	G. F. Stinchfield, Engineer.
LIGHTING AND POWER				
Oklahoma	Wetumca	May 6	Furn. material, light and water system, inc. 3 mi. line arc lamps, centrifugal pump and motor, etc	City Engineer.
Ohio	St. Bernard	May 7	Furn. direct-current lighting equipment	W. J. Boller, Clk. Bd. Public Affairs.
Arkansas	Ft. L. H. Roots	May 10	Wiring buildings and building electric lighting system at fort	Constructing Quartermaster.
Maryland	Baltimore	May 11, 11 a.m.	Furn. and erect. elec. and mech. equipment for sewage works	C. W. Hendrick, Ch. Engr. Sew. Com.
Rhode Island	Ft. Greble	May 11, 11 a.m.	Extending and remodeling underground elec. distrib. system	Lt. F. H. Phipps, Jr., Constr. Q. M.
Ohio	Columbus	May 14	Switchboard and connecting cables for controlling alt. generators in new power house at Ohio penitentiary	Osborn Eng. Co., Cleveland.
Dist. of Col'bia	Washington	May 21, 11 a.m.	Additions to power plant and dis. systems, U. S. Med. School	Bur. Yds. & Docks, Navy Dept.
Kansas	Lincoln Center	May 16	Furn. 125 h.p. engine, 75 k.w. generator, 75 h.p. engine, two 125 h.p. boilers, for water and lighting plant	City Clerk.
Manitoba	Winnipeg	May 16, 11 a.m.	Installing conduit, mains, sub-station transformers, etc	M. Peterson, Sec'y Bd. of Control.
Florida	Ft. Dade	May 20	Constructing electric lighting system	Constructing Q. M.
Alabama	Ft. Morgan	May 23	Constructing electric lighting system	Capt. H. B. Chamberlin, Q. M.
Delaware	Ft. Du Pont	May 23, 11 a.m.	Furn. and instali. two 75 h.p. water tube boilers, 1 feed pump, feed-water heater, new steam and exhaust mains, and removals and changes in pump house	Constructing Quartermaster.
North Carolina	Ft. Cassell	May 25	Constructing electric lighting system	Lieut. W. E. McCleary, Constr. Q. M.
Oklahoma	Medford	May 26	Furn. two 16x5.5 ft. R. T. boilers, 2 feed pumps, one heater; 100 k.w. belted gen. a. c., 2,300-volt; switchboard, complete; series tungsten regulator; seven 5 k.w. and two 3 k.w. transformers; 100 30-ft., 300 25-ft. and 5 40-ft. cedar poles; bids of April 13 rejected O'Bannon & Foster Co, Engrs. Joplin Mo	City Clerk.
Texas	Ft. Crockett	May 31, 2 p.m.	Constructing electric lighting system	Capt. P. Whitworth, Constr. Q. M.
MISCELLANEOUS				
New York	Brooklyn	May 6, 10:30 a.m.	Bldg. underground fire alarm telegraph system	R. Waldo, Fire Comr., N. Y. City.
Georgia	Atlanta	May 7, noon	Constructing 2 fire stations, Nos. 7 and 12	Board of Fire Masters.
North Dakota	Lisbon	May 9	Furn. corrugated steel culverts during season	I. E. Arnston, County Auditor.
Nevada	Carson City	May 9	Furnishing 300 steel cells, with window guards, gratings, cell-door locking and operating devices	J. W. LeGate, Clk. St. Bd. Prison Commissioners.
Ohio	Dayton	May 9, noon	Furnishing 2 flat cars for use at garbage loading station	J. C. Ely, Dir. Pub. Service.
West Virginia	Elkins	May 9, 3 p.m.	Erecting jail and jailer's residence; B. F. Smith, Architect	F. A. Rowan, County Clerk.
North Carolina	Wentworth	May 10, noon	Building a jail; Wheeler & Stern, Charlotte, Architects	J. T. Holland, Clk. Co. Comrs.
Kansas	Hutchinson	May 10, 3 p.m.	Sprinkling Seventh ave., east, from Main to Elm st	Edward Metz, City Clerk.
Georgia	Americus	May 10	To audit books and records of clerk and treasurer and supt. of water works from July 1, 1907, to April 1, 1910	W. E. Brown, Chm. Finance Com.
Virginia	Norfolk	May 11, noon	Erecting police and fire station. Lee & Diehl, Archts	Board of Control.
Ohio	Dayton	May 11, noon	Bldg. concrete retaining wall, mortar-faced, 265 cu. yds	J. C. Ely, Dir. Pub. Service.
Massachusetts	Springfield	May 12	Heating and ventilation, and plumbing for Auditorium, Tower and passage of New Municipal Buildings	Pell & Corbett, N. Y. City, Archts.
Massachusetts	Boston	May 15	Furnishing watering carts, also watering and oiling sts. in 10 districts of city; also for cleaning sts. and sidewalks in 4 districts, to Dec. 1, 1910	G. C. Emerson, Supt. of Streets.
Illinois	East St. Louis	May 16, noon	Constructing diversion channel for Cahokin creek and necessary levees and embankments, etc., San. Dist.	Bd. Trus. East Side Levee Dist.
Kansas	Hutchinson	May 17, 3 p.m.	Sprinkling Sherman st., east, and Tenth ave., west	Edward Metz, City Clerk.
Washington	Aberdeen	May 18, 5 p.m.	Bldg. 25-ton garbage incinerator	P. F. Clark, City Clerk.
Louisiana	New Orleans	May 20, 1:30 p.m.	Furn. and erect structural steel and cast iron for any or all of 5 sheds; $1,000 check. A. C. Bell, Engr.	Hugh McCloskey, Pres. Port Comrs.
Ohio	Cincinnati	May 20	Bldg. culverts, changing channel of creek	Board County Commissioners.
New York	Albany	May 24	Dredging channel Hudson river, 15 miles	F. C. Stevens, Supt. Public Works.
Delaware	Wilmington	May 24, noon	Dredging Mispillion and Appoquinimink rivers, Del	R. R. Raymond, U.S. Engr. Office
Ohio	Columbus Bar'ks	May 25	Constructing garbage crematory and building	Capt. H. J. Hersch, Q. M.
Brit. Columbia	Vancouver	May 31, 3 p.m.	Installation of garbage destructor plant at Bridge st. yard on False Creek to destroy at least 70 tons mixed garbage per 24 hours, complete; bidders submit plans, etc	W. McQueen, City Clerk.
Pennsylvania	Philadelphia	June 17	Furn. dredge, tugboat and dump scows	Jos. Hasskarl, Act. Dir. Bd. Pub. Aff.

posed sewer work; construction will begin within 25 days.

CONTRACTS AWARDED

Pasadena, Cal.—Sewer, Coloma ave., to Chamberlain & Williamson, $10,588.81.

Lexington, Ky.—Sanitary sewer, E. Main st., to Thos. O'Day; 8-in. pipe, $1.46 per ft.; 5-in., 73c.; 5-in. Y branches on 6-in pipe, 50c. each; manholes, $40; flush tanks, $60; rock excavation, $4 per cu. yd.; timber sheathing, $25. per 1,000 ft. B. M.

Klamath Falls, Ore.—Constructing entire sewer system except pipe to Clues Construction Co., $16,990; furnishing pipe to Gladding, McBean & Co., San Francisco.

WATER SUPPLY

Burr Oak, Kan.—Town of Republic, at mouth of the White Rock, will vote on $15,000 water works bonds.

Enid, Okla.—City is considering installation of water works plans.—W. D. Hitchcock, Water Commissioner.

Baltimore, Md.—Work will soon begin on erection of dam on Gunpowder River at Loch Haven, which will control reservoir; capacity, 21,000,000,000 gals.—A. M. Quick, Superintendent and Engineer of Water Works.

Fairbury, Neb.—Citizens have defeated proposition to grant present company new franchise for water and light.

Hood River, Ore.—Bids for construction of the water system, which were received April 25, were returned unopened. further action will be taken by Council.—P. M. Morse, Engineer.

Harrisburg Pa.—Water Commissioners will at once take steps to construct reservoir and high-pressure pump at Reservoir Park.

Williamson, W. Va.—Citizens have voted $47,000 bonds for improvements to water works system.—A. C. Pierson, Mayor.

Ladner, B. C., Can.—Bids will be received May 13 by Council for $135,000 water works debentures. N. A. McDiarmid can be addressed.

CONTRACTS AWARDED

Kansas City, Kan.—Water piping, 39,000 tons, to U. S. Car & Foundry Co.; about $100,000.

Medford, Okla.—Furnishing pipe to E. J. Merkle, Kansas City, Mo.: 1560 ft. 6-in. c. i., $30 per ton; 9900 ft. 4-in., $31; 10,000 lbs. special castings, 3c.; other bidders: National Machinery Co., Oklahoma City, $4502; Sheffield C. I. Pipe Co., Kansas City, Mo., $4463; 9 fire hydrants to English Iron Works, Kansas City, Mo., $26; other bidders: E. J. Merkle, $254; National Machinery Co., $246; 5 gate valves to English Iron Works, $8.50; E. J. Merkle, $45; National Mach. Co., $50; pumping machinery, to Westinghouse Electrical & Mfg. Co., Kansas City, Mo.; cap. 400,000 gals., including two pumps and motors, $1530; English Iron Works, $1905; E. J. Merkle, $1995; H. R. Worthington, Kansas City, Mo., $2,635.—O'Bannon & Foster Co., Joplin, Mo., Engineers.

Weston, Ont., Can.—Pumping machinery run by motors to Smart-Turner Mfg. Co., Hamilton, Can., $6,758. Other bidders, Canada Foundry Co., Toronto; John McDougal Caledonean Works, Montreal; Purdy-Mansell Mfg. Co., Toronto. Filters to American Water Softener Co., Philadelphia, $2,742. Other bidders, John McDougal Caledonean Works,. Montreal; Roberts Mfg. Co.; Pittsburg Filter Co. Pump house to George B. Moogk, Waterloo, $4,500. Other bidders, F. C. Taylor, County of York; Wells & Gray, Toronto.—J. H. Taylor, Village Clerk.

LIGHTING AND POWER

Martins Ferry, O.—Engineer Edgar Reed, Pittsburg, has completed plans and specifications for new equipment for electric light plant.

Beaufort, S. C.—Plans are about completed for municipal electric light plant.

Bryan, Tex.—M. A. Currie, of the Caddo oil fields of Shreveport, La., has made application to the City Council of this city for a franchise to install a plant for natural and manufactured gas.

Martinsville, W. Va.—New Martinsville Heat & Power Co. will expend $10,000 in installation of gas engines to replace steam engines.

Wheeling, W. Va.—Wheeling Electrical Co. has again applied for 50-year franchise.

Janesville, Wis.—Contract with Janesville Electric Light Co. expires July 1.

CONTRACTS AWARDED

Cleveland, O.—Wire, 7,000 lbs. No. 12 hard-drawn triple braid copper wire for police signal system to John A. Roebling Sons Co., Trenton, N. J., $1,152.

Brunner, Tex.—Erection power house for Brunner Water and Light Co. to D. D. Pittman, Houston.

Black River Falls, Wis.—Equipment of power plant, to Power Engineering Co., of Minneapolis, $4,000; installation of generator and switchboard, to the Ft. Wayne Electric Co., Ft. Wayne, Ind., $5,000; power house will be built at cost of $3,500.

FIRE EQUIPMENT

Douglas, Ga.—City will erect 2-story fire department and city hall building.

Lewiston, Me.—Fire Chief Moriarty has recommended improvement of fire protection.

Omaha, Neb.—Fire protection for Dundee is being considered.

Fort Worth, Tex.—Chief W. E. Bideker has made following recommendations for improvement of fire department: Complete overhauling of present fire alarm system; purchase of site and erection of station in Quality Hill section and installation of a combination chemical and hose wagon; purchase of site and erection of fire department repair and machine shop; also purchase of following equipment: Two service ladder trucks, auto combination engine, third size steamer, second size steamer to replace old engine now in use and purchase of two or more auto combination chemical and hose wagons each year to replace horse-drawn apparatus.

Oregon, Wis.—Purchase of hose is being considered.

CONTRACTS AWARDED

Maysville Ky.—Combination fire apparatus to Knox Company, Springfield, Mass.

Lake Charles, La.—Hose, 1,000 ft., to Eureka Fire Hose Co.

ELECTRIC RAILWAYS

Clarksville, Ky.—Clarksville and New Providence Railway Co. has been incorporated to build railway from Clarksville to New Providence; capital $25,000.—Austin Peay, N. L. Carney, L. Bloch and others, Incorporators.

Yankton, S. D.—Iowa & Dakota Interurban Railway has been incorporated to build 125-mile railway between Sioux City, Ia., and Mitchell, S. D.; capital stock, $500,000; directors, B. E. Wells, E. E. Bamford, H. E. Valentine, Centerville; C. L. Phillips and W. G. Amundson, Lake Andes.

BRIDGES

Fort Wayne, Ind.—Park Commissioners have asked Council for appropriation of $1,500 for repairing floors of foot bridges at Swinney Park and Lawton Park.

Wadena, Minn.—Township Board of Huntersville is considering erection of bridge across Crow Wing River; cost $5,000.

Lancaster, Pa.—Plans are being prepared by Engineer F. H. Shaw for reinforced concrete bridge for Lancaster County, bids for which will be taken in about 20 days.

Johnstown, Pa.—Highway Committee is considering erection of highway bridge across Conemaugh River; cost $40,000.

Scranton, Pa.—Mulberry st. viaduct plans have been approved by city and the railroads concerned.

CONTRACT AWARDED

Springfield, Ore.—Constructing Portland, Eugene and Eastern bridge to L. N. Roney.

MISCELLANEOUS

Decatur, Ala.—Citizens have voted $25,000 bonds for erection of city hall, jail and fire department building.

Indianapolis, Ind.—Mayor Shank will recommend purchase of auto patrol.

Atlantic City, N. J.—Council is considering establishment of Venetian park, cost $102,000, in Chelsea.

Stillwater, Okla.—Payne County will erect jail.

Philadelphia, Pa.—Bids will be received May 16, noon, for $8,000,000 city loan.—J. E. Reyburn, Mayor.

Salt Lake City, Utah.—Police Chief S. M. Barlow is favorable to larger appropriation and purchase of two police autos instead of $6,000 patrol as proposed.

Juarez, Mex.—Acting Jefe Politico Francisco Portillo proposes to build $70,000 structure to contain all municipal offices, now strung out.

CONTRACTS AWARDED

Marysville, Cal.—Sweeping streets to Jos. Heenan, $135 per month; sprinkling to Arnoldy & Yengler.

Jersey City, N. J.—Public comfort station, Elysian Park, to Robert Roth, $4,106.

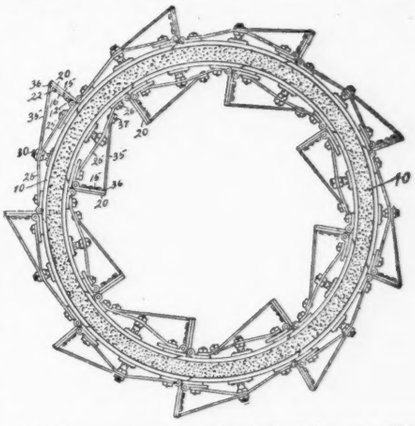
BIDS RECEIVED

Omaha, Neb.—Auto for Street Commissioner: W. L. Huffman Automobile company offered choice of three machines at $1,200, $1,175 and $1,100; H. E. Fredrickson Company, choice of two machines at $1,200 and $1,175; Sweet-Edwards Company, $1,200.

PATENT CLAIMS

952,066. FORM FOR CONCRETE CISTERNS, SEWERS AND THE LIKE. George G. F. Boswell, Indianapolis, Ind. Serial No. 464,638.

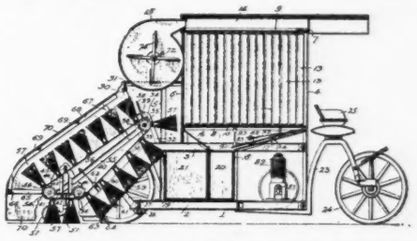
A mold form for concrete cisterns,, sewers and the like made up of mold plates adapted to be placed with their edges ad-



jacent successively, pivoted plates on the adjacent edges of said mold plates and adapted to lie against each other, means for temporarily securing said adjacent pivoted plates together and means for changing and maintaining the curvature of said model plates.

953,201. STREET-SWEEPING MACHINE. Harry R. Harn, Denver, Colo. Serial No. 431,951.

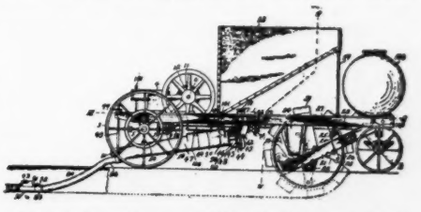
In a street-sweeping machine, the combination of a wheeled vehicle; slideways on the rear end of the vehicle; slide bearing blocks adjustably mounted in the slideways; a shaft supported in said blocks, and sprocket wheels adjacent the ends of the shaft; a frame pivotally secured to said blocks; adjustable casters for supporting the opposite end of the frame; sprocket



wheels on the frame in line with the sprocket wheels on the shaft; endless chains connecting the alined sprocket wheels and brushes secured to the chains; an inclined apron in contact with the upwardly moving brushes, and hinged at its upper end to the vehicle frame; adjusting means connecting the lower end of the apron and the brush-carrying frame; a housing for the brushes; a receptacle for receiving the heavy sweepings from the apron; air induction means for conveying the dust from the sweepings; a receptacle for receiving the dust, and means for operating the brushes and air induction means.

952,488. APPARATUS FOR MAKING AND LAYING CONTINUOUS CONCRETE PIPE. John L. Wiggins, Dallas, Tex., assignor to the National Land and Sub-Irrigation Co., a corporation of Arizona. Serial No. 467,992.

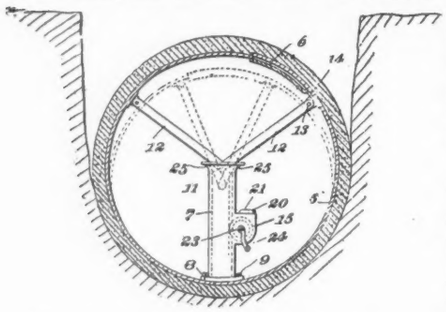
The combination with a motor driven truck, of a trenching device carried by said truck and adapted for actuation from



the truck motor, a mixing device and feeder, both adapted for actuation from the truck motor, and a mold adapted for receiving material from the feeder and depositing formed pipe in a conduit provided by said trencher.

954,696. ADJUSTABLE FRAME FOR BUILDING CONCRETE CULVERTS, CISTERNS, AND THE LIKE. William Prilliman, Wichita, Kan. Serial No. 494,145.

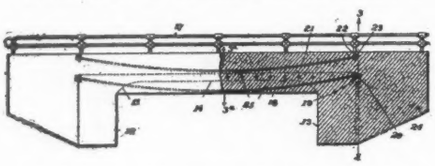
A mold including a longitudinally split expansible shell, a casing secured to the interior walls of the shell opposite the split portion thereof, a plunger operating within the casing and provided with a rack, links



forming a pivotal connection between the upper end of the plunger and the interior walls of the casing, a pinion engaging the rack for raising and lowering the plunger to extend and contract the shell, and means for locking the plunger in different positions of adjustment.

954,750. REINFORCED-CONCRETE BRIDGE. John E. Mandeville, Hawley, Pa. Serial No. 477,880.

A reinforced concrete bridge comprising abutments, a roadway slab extending between the abutments and ribs or girders extending between the abutments on the under side of the roadway slab, said roadway slab, ribs and abutments being integral, metal tension members embedded in each rib, said members being located at the lower edges of the ribs near the middle of



the bridge and extending upwardly to the plane of the roadway slab at the ends of the bridge, the ends of said tension members being threaded and provided with threaded nuts, anchor plates extending transversely of the bridge in the plane of the roadway slab and through which the threaded ends of the tension members extend, said nuts being adapted to be turned up against the anchor plates to tighten the tension members, and metal rods extending across the bridge and embedded in the roadway slab and ribs, said rods being anchored in the parapets for the purpose set forth.

INCINERATOR SUPERINTENDENT WANTED

The City of Milwaukee, Wis., has taken another advanced step toward insuring the absolute success of its new refuse incinerator by throwing open the position of Superintendent to all applicants, whether residents or not of the city. The new position will pay $2,000 a year. The requirements will be U. S. citizenship, age 21 years or more; applicants to be mechanical or civil engineers and possess a special knowledge and be familiar with the theoretical and practical disposal of refuse by incineration; good health, habits and recommendations. The examination for this position will be held on May 12th, and all applications for the position must be received not later than May 9th or 10th, at the office of the Board of City Service Commissioners, Milwaukee. The idea in admitting candidates for examination from all parts of the country is to insure the best available material.

INCORPORATIONS

American Railway & Street Car Indicator Company, New York; manufacture and deal in railway and street car indicators; capital, $200,000. Incorporators: Otto L. Egloff, H. W. Wier, Wh. Wonderhold, all of 50 Church street, New York City.

Burnham & Ives Company, Bloomington, Ill., engineering and construction work; capital, $10,000. C. H. Burnham, Frank W. Ives, Chas. B. Ives Company, Bloomington, Ill.

Chicago Paving Laboratory, Chicago, Ill; $2,500; manufacturing chemicals and compounds and contracting. Incorporators: Lester Kirschbaum, William Karr Steele, Clarence J. Silber.

Colonial Illuminating Co., Manhattan Boro., New York, N. Y.; manufacture and deal in electric lights and machinery; capital, $150,000. Incorporators: Eugene M. Jerome, 2 Rector Street, Wm. B. Fiske, Robert C. Finch, both of 1328 Broadway, all of New York City.

Empire State Paper Bottle Co., Gloversville, N. Y.; manufacture and deal in paper boxes, tubes, bottles, etc.; capital, $100,000. Incorporators: Radcliffe Delamater, Thomas B. Robinson, C. Fay Delamater, all of Gloversville, N. Y.

Handy Brothers Contracting Co., Bronx Boro., New York, N. Y.; general contracting; capital, $1,000. Incorporators: Edward V. Handy, Martin A. Handy, Elizabeth V. O'Donnell, all of 2330 Morris Ave., Bronx Boro., New York City.

Ithaca-Auburn Power Co.; manufacturing electricity for light and power; capital $500,000. Incorporators: Albert H. Flint, 230 W. 50th Street, New York City; Herbert A. Clarke, Cornell Heights, Ithaca, N. Y.; Robert L. Post, same address.

Municipal Engineering & Construction Co., Chattanooga, Tenn.; capital $45,000. Incorporators: W. A. Sadd, Joe Brown, Frank Shurlock, A. S. Glover and Foster V. Brown.

Myers' Gas Generator Company, Buffalo, N. Y.; manufacture and deal in machinery operated by gas, etc.; manufacture and deal in all kinds of gas machinery and fixtures; capital, $3,000,000. Incorporators: Chas. H. Myers, 172 Edward street; Percy L. Marvin, 450 Richmond avenue; John H. Schumacher, 221 Master street, all of Buffalo, N. Y.

Pfaff & Smith Co., Charleston, W. Va.; capital, $100,000. Incorporators: Anton Pfaff, Adam Smith, R. S. Franklin, Irvin S. Goldbarth and Chas. H. Saunders, all of Charleston.

San Angelo Water, Light and Power Company, San Angelo, Tex. Name changed from that of San Angelo Water Works Company, and capital increased from $150,000 to $225,000.

Santanoni Contracting Co., Newcomb, Essex Co., N. Y.; general contractors, railways, reservoirs, etc.; capital, $25,000. Incorporators: John Anderson, Jr., Newcomb, Essex Co., N. Y.; Geo. N. Ostrander, 443 Broadway, Albany, N. Y.; Patrick Tummins, Newcomb, Essex Co., N. Y.

Stillwater Crushed Stone Co., Mechanicville, Saratoga Co., N. Y.; construct roads, etc.; deal in crushed stone, etc.; capital, $18,000. Incorporators: Roy Smith, Rachel M. Smith, both of Mechanicville, N. Y.; Wm. M. Fox, Saratoga Springs, N. Y.

The Cretan Stone Co., Manhattan Boro., New York, N. Y.; quarry and prepare for market all kinds of stone, etc.; capital, $20,000. Incorporators: Leon Buehler, Chas. Lauter, both of 451 West 28th Street; Robert Hopper, 140 Nassau Street, all of New York City.

The Virginia Light, Heat and Power Co., Virginia, Ill.; capital, $24,000; to operate water works, manufacture and sell gas and electricity and install electrical appliances. Incorporators: Louis A. Petefish, Charles M. Hubbard, Matt Yaple, Roy Ray.

Wulff Engineering Co., Tarrytown, N. Y.; general construction work; civil, electrical, mechanical and hydraulic engineers; capital, $15,000. Incorporators: Eberhard J. Wulff, Chas. MacDonald, Walter E. Stockwell, all of Tarrytown, N. Y.

PROPOSALS

SEWERAGE AND SEWAGE DISPOSAL WORKS

City of Bridgeton, N. J.

Pursuant to a resolution adopted April 26, 1910, City Council will receive at its meeting to be held on May 17th 1910, at 12 o'clock noon, sealed proposals for furnishing all material and doing all work necessary to the complete construction of about 3.2 miles of vitrified pipe sewers, from eight (8) to twenty-four (24) inches in size, with Y branches, manholes, flushing manholes and other necessary appurtenances, and of a sewage disposal works and pumping station, including the necessary piping, grading, etc.

Plans may be seen and specifications and forms of proposal obtained at the office of the City Clerk, Bridgeton, N. J., or at the office of Clyde Potts, 30 Church street, New York City.

Each bid must be accompanied by a certified check on a solvent bank for three thousand dollars ($3,000.00).

The said City Council reserves the right to reject any and all proposals to waive any informality in the proposals received, and to accept any proposal, which it deems to be most favorable to the interests of the city.

Dated April 28, 1910.

Jacob B. Jones, City Clerk of
(18) Bridgeton, N. J.

SANITARY SYSTEM AND DISPOSAL PLANT.

Notice to Contractors.

St. John, Kan.

Sealed proposals will be received by the City Clerk of St. John, Kan., up to three (3) o'clock p.m. of Friday, the 20th day of May, 1910, as follows:

For constructing a complete sanitary sewer system, including disposal plant, for the city of St. John, Kan., in accordance with the plans and specifications on file.

Specifications, instructions to bidders, blank proposals and a complete set of detailed plans and profiles are on file at the office of the City Clerk, St. John, Kan., and at the office of the Engineers, Kansas City, Mo.

Any one desiring a set of plans for personal use in submitting a bid may obtain the same by application to the Engineers and a payment of five (5) dollars to cover the cost of the prints.

Each bid must be accompanied by a certified check of one thousand (1,000) dollars.

The city reserves the right to reject any and all bids.

F. A. Gillmore, Acting Mayor.
A. O. Seevers, City Clerk.
Burns & McDonnell, Engineers,
(18) Scarritt Building, Kansas City, Mo.

WATER WORKS BONDS

El Reno, Okla.

Sealed bids will be received up to 8 P. M., May 16th, 1910, on $250,000.00, 25-year, 5 per cent Waterworks Bonds. Certified check for $2,000.00 required. Council retains usual right to reject any bids.

J. A. LA BRYER,
Mayor.

BETTER GOODS FOR LESS MONEY

HEADQUARTERS FOR WATER WORKS SPECIALTIES

GLAUBER COCKS GLAUBER CLEVELAND O.

SAMPLES AND PRICES FOR THE ASKING

4900 TO 5100 SUPERIOR AVE. CLEVELAND O